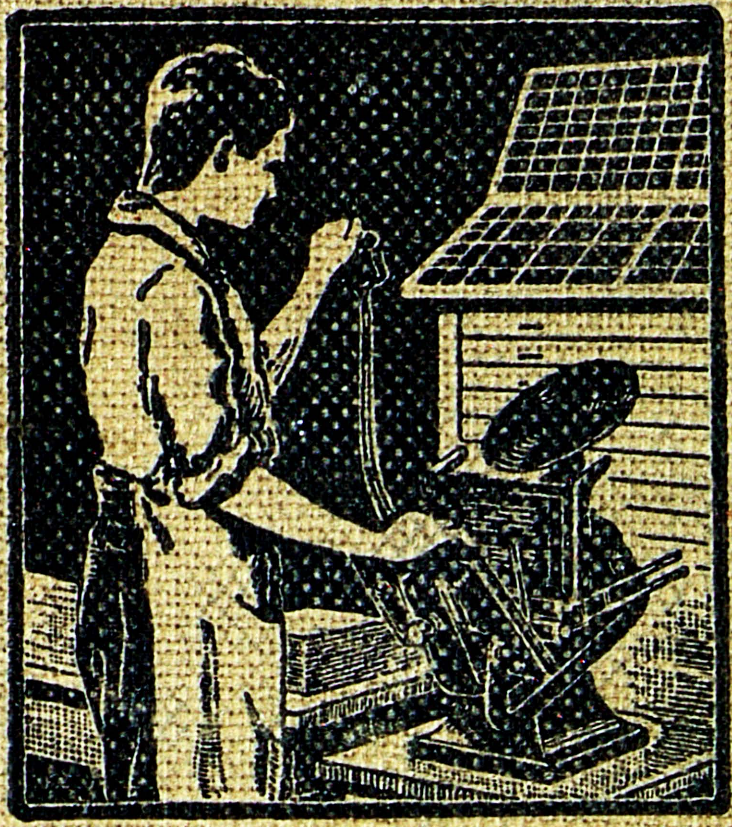
PRINTING

A CRAFT FOR SCHOOLS



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BY

H. E. V. GILLHAM

ART MASTER L.C.C. ELTHAM CENTRAL SCHOOL

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PREFACE

In preparing this book I have endeavoured to demonstrate the possibilities of using printing (a craft hitherto practised but little in the schools) as a means of fostering the creative instinct in children and of developing their powers of appreciation—two essential aims which must take their place in any progress towards a balanced and liberal culture. I feel that such a craft as printing—the term is used in a broad sense, and includes such associated activities as block-cutting and pattern printing—is of especial value, not only for the dexterity in handicraft its practice demands, but in helping the child to realize how vital a factor is design for any degree of success in craftwork. It should, in addition, bring to him some vision of the artistry and fine craftsmanship which is being applied, in a growing measure, to the making of patterns, prints, and books. A scheme of work, devised with these ends in view, which has met with some measure of success in my own experience, may, I hope, be full of suggestions to others; particularly perhaps to those in the newer type of senior school now being established as a result of the recent reorganization of our system of elementary education.

Many of the examples shown have been produced in connection with my own teaching, and I take this opportunity of thanking Mr. J. G. Nisbet, B.Sc., headmaster of the Eltham Central L.C.C. School, for permission to reproduce these, and still more for continual kindly help and encouragement. I am also grateful to Miss M. E. Morgan for assistance in the revision of MSS. To Mr. Eric Gill and the authorities of the Victoria and Albert Museum I am greatly indebted for permission to reproduce the example of fine lettering shown in Plate VIII; and to the Director of the

Science Museum, South Kensington, for allowing me to include the photograph of the Caxton-type press (Plate IX). I appreciate the kindness of Messrs. Jonathan Cape in permitting me to quote from *Friends and Adventures* (by "T," of *Punch*); and I am grateful to the Clarendon Press, of Oxford, for enabling me to reproduce the poem by Dr. Robert Bridges. The Excelsior Printers' Supply Co., Ltd., of Farringdon Street, E.C.4, kindly lent the block for Fig. 36.

H. E. V. GILLHAM.

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PRINTING
A CRAFT FOR SCHOOLS

CHAPTER I

INTRODUCTION

WHAT is there about printing which makes such amiable fanatics of us all? I suppose we feel that printing is a noble craft of high lineage, well worth serving; useful primarily, and useful in an immensely important field of human endeavour—the communication and preservation of ideas. It offers the chance, too, of making beautiful things and, through the agency of swift, almost incredibly competent machines, distributing these beautiful things broadcast to the many, where your painter can necessarily only reach the few. To those of us who have the desires of artists with the essential divine creative fire left out—the practice of a craft like this offers great consolations.

"Friends and Adventures," by "T" (of "Punch").

THE inclusion of some form of craftwork in a balanced scheme of education needs no defence in these days. "Handwork" and "Manual Training" have for many years been seeking to provide opportunities for the expression of the creative instinct latent in all children, which, under the influence of the older and almost entirely academic training, was in danger of being overlaid and stifled. The question is no longer "Craftwork or no craftwork?" but "What form of craftwork shall we choose?" There are many considerations to be borne in mind in deciding this.

The type of work chosen should, in the first place, be something which is—in the real sense of the word—a craft; it should be a form of handicraft that has played a dignified and necessary part in the growth of the race, and one which demands a complete mastery of materials and discipline of

hand. The practice of the craft should fulfil a real human need; to put it quite simply, whatever is made should be worth the making. Much of the "handwork" done in the schools, it is to be feared, misses this vital point, and even in the adult world the term "art-craft" (in some quarters at least) is apt to suggest superficial "prettiness" rather than necessary work done as well as it is possible to do it.

FIG. 1
LINOLEUM-CUT

The work chosen should carry with it the possibility of a very close relation with the art teaching of the school; the training of the hand should be accompanied by a continual opportunity for the expression of the artistic impulse, and by a steady progress in the acquisition of that elusive possession, good taste. In addition, the practice of the craft should, of itself, in its processes and by the use of its tools and materials, carry with it a fair measure of interest, quite apart from the results to be obtained from it.

The craft of printing, from the simplest pattern-printing with a pencil-end to the production of colour prints or the publication of a school magazine, is described in the following pages in an endeavour to present a satisfactory and perhaps fresh solution to this problem of selection. In the opinion of the writer, it fulfils to an admirable degree the conditions outlined above.

That it is a craft worth serving and practising, or that its productions have played an important and necessary part in our racial development, is beyond dispute. The invention of printing from movable types was one of the turning points in history; with it came the great opportunity for the crystallization, interchange, and preservation of ideas which has so accelerated the rate of human progress

in the centuries since the first book left the press of Gutenburg in Mainz.

There are few crafts where opportunities for the expression of the artistic sense are greater or more numerous than in printing. Apart from its use as a vehicle in the reproduction of art work in the form of illustration or decoration, the medium has great possibilities in the way of pattern

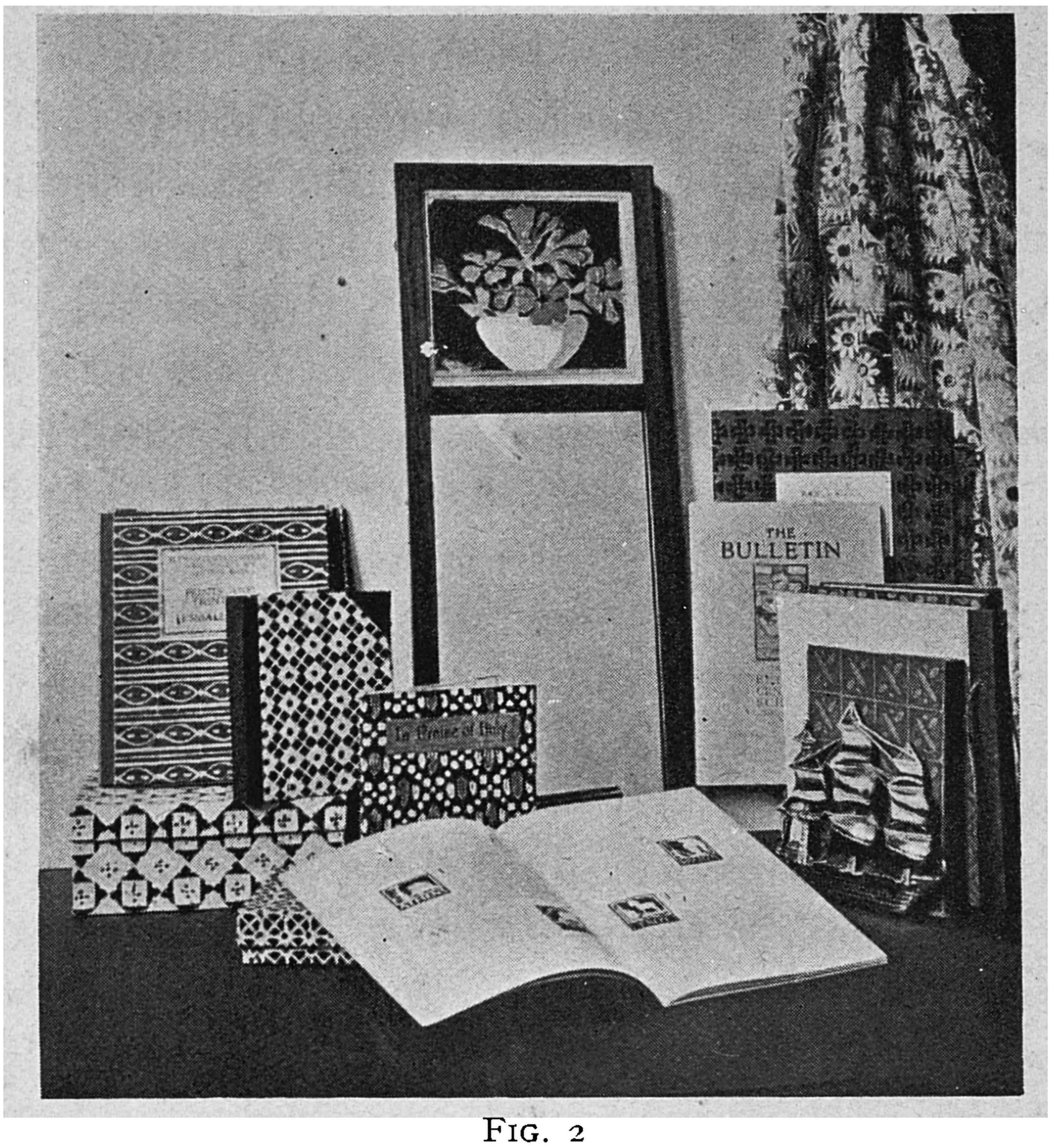


FIG. 2
EXAMPLES OF SCHOOL PRINTING

printing, both on paper and fabric; the choice and appropriate use of type *faces*, and the appreciation of fine lettering; the arrangement and display of type; the use of type in masses and the appearance of pages; all these alike offer continual opportunities for careful handicraft and a cultivated taste. One has only to call to mind the productions of the early makers of books, and men like Albrecht Dürer, the type designers and cutters of the seventeenth

and eighteenth centuries, William Morris and his efforts to revive fine printing, the work of the modern presses—such as the "Ashendene" or the "Golden Cockerell"—and living type designers and engravers such as Eric Gill, to realize that printing is a craft which has called forth the highest powers of artistic expression.

The extent to which printing contains an innate appeal —it might almost be said fascination—only those who have practised it can fully understand. Perhaps one reason for this lies in the almost magical quality of reproduction; that once the block is cut, or the type assembled, we can produce with little effort as many prints as we please. Another point of difference between printing and other crafts is, that whatever time or patience may have been expended in its preparation, the finished result never appears laboured, but has always the fresh, pristine quality arising from clean ink on clean paper.

The term "printing" here embraces a fairly wide range of processes. The simpler kinds of work, such as pattern-printing with sticks, "blocks" of potato, linoleum, or wood, are eminently suitable for the junior school, needing little or no special equipment beyond the ordinary school stock; while the more advanced letterpress work, and what might be called "pictorial" printing, can be carried on into the senior schools (where the teaching of practical work is to receive special attention) and into the central schools, especially those with a technical bias. The following pages are based upon actual experience in London elementary and central schools, and almost all the examples illustrated have been produced in connection therewith.

CHAPTER II

PATTERN PRINTING

IF the end of a pencil is covered with ink or colour, and impressed on a piece of paper, the result will be a circular (or perhaps a hexagonal or elliptical) print. If this shape is considered as a unit of design, and is repeated on a line at regular intervals, a border pattern is produced. The same spot, repeated in lines both horizontally and vertically, so that the whole piece of paper is covered with units arranged in a regular way, produces what is known as an *all-over* pattern. This act of repetition is the simplest way of producing pattern; any shape, however simple, and however lacking in interest it may be in itself, can become, upon repetition, very attractive and satisfying.

This principle of repetition is in extensive use where large areas have to be covered, such as in the production of textiles, wallpaper, and linoleum. Printing is probably the simplest and most successful means of reproducing the units necessary in this "all-over" type of design, and it is, in fact, the one in common use in the manufacture of wallpaper and a large proportion of decorated fabrics.

From the point of view of teaching this important principle in design, pattern-printing from sticks, blocks of wood, or of linoleum, has much to recommend it. Where the unit has to be repeated laboriously by free drawing, or by tracing painfully over a large surface, the exercise becomes tiring and freshness is apt to be lost. Reproduction of the unit by printing, however, is sufficiently easy to allow the child to devote his attention primarily to experiment in methods of arrangement, and to note the effect of variation in size, colour, and disposition of the units.

STICK PRINTING. The method of producing pattern by

the print obtained from a pencil-end is, in fact, the process known as "stick-printing" in its simplest form. For very small spots (which are extremely useful as a contrast to larger units) the end of a paintbrush can be filed away until it becomes the desired size. Fig. 3 shows that quite pleasing border and all-over patterns can be made with nothing

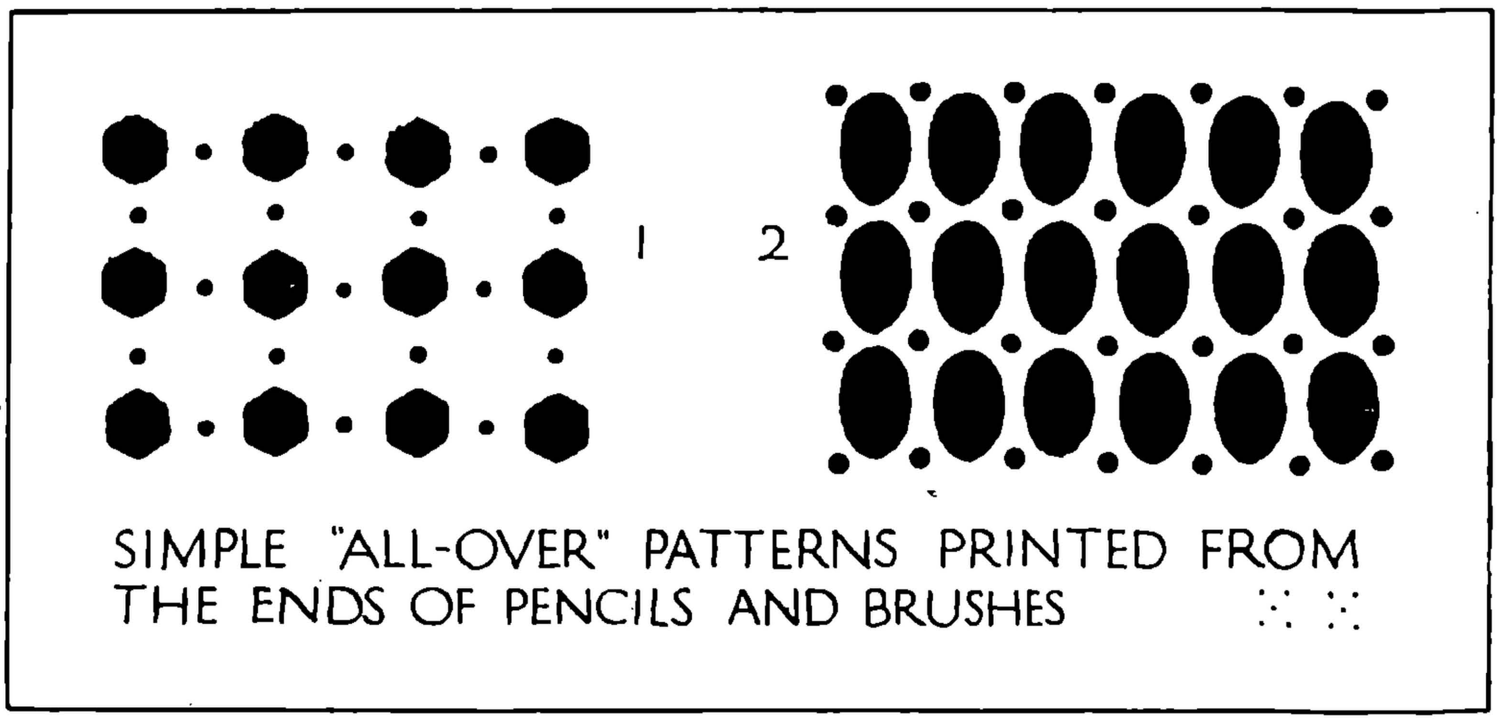


FIG. 3
STICK PRINTING WITH PENCIL- AND BRUSH-ENDS

more than the ends of pencils and brushes. Further variety in the size and shape of the units may be arrived at by the preparation of a number of other "sticks." These can be made quite easily from suitable pieces of wood, such as dowel rod, old penholders, or the prepared material sold for strip wood-work. The strips or rod should be cut into lengths of about 5 in., the ends being sawn square and given a smooth finish with a fine file and glasspaper. Variation in the shape of the end (and, consequently, in the pattern it produces) can be obtained by the use of files and chisels. Fig. 4 shows a few of the possible units. In No. 2, where the unit is annular, the centre should be drilled out first and then the outer edge shaped, to avoid any difficulty in getting the hole central. A pattern can, of course, be cut at both ends of the stick.

In printing, wet colour or ink is applied to the end of the block, either with a brush or by pressing it on to a pad.

Such a pad is shown in Fig. 4, and consists of a piece of felt placed in a small shallow tin, such as the lid of a box. The colour used may be ordinary water-colour, coloured ink (of which nowadays quite a variety can be bought cheaply), or, and this especially on a tinted ground, some form of body colour, such as that used for posters and showcards.

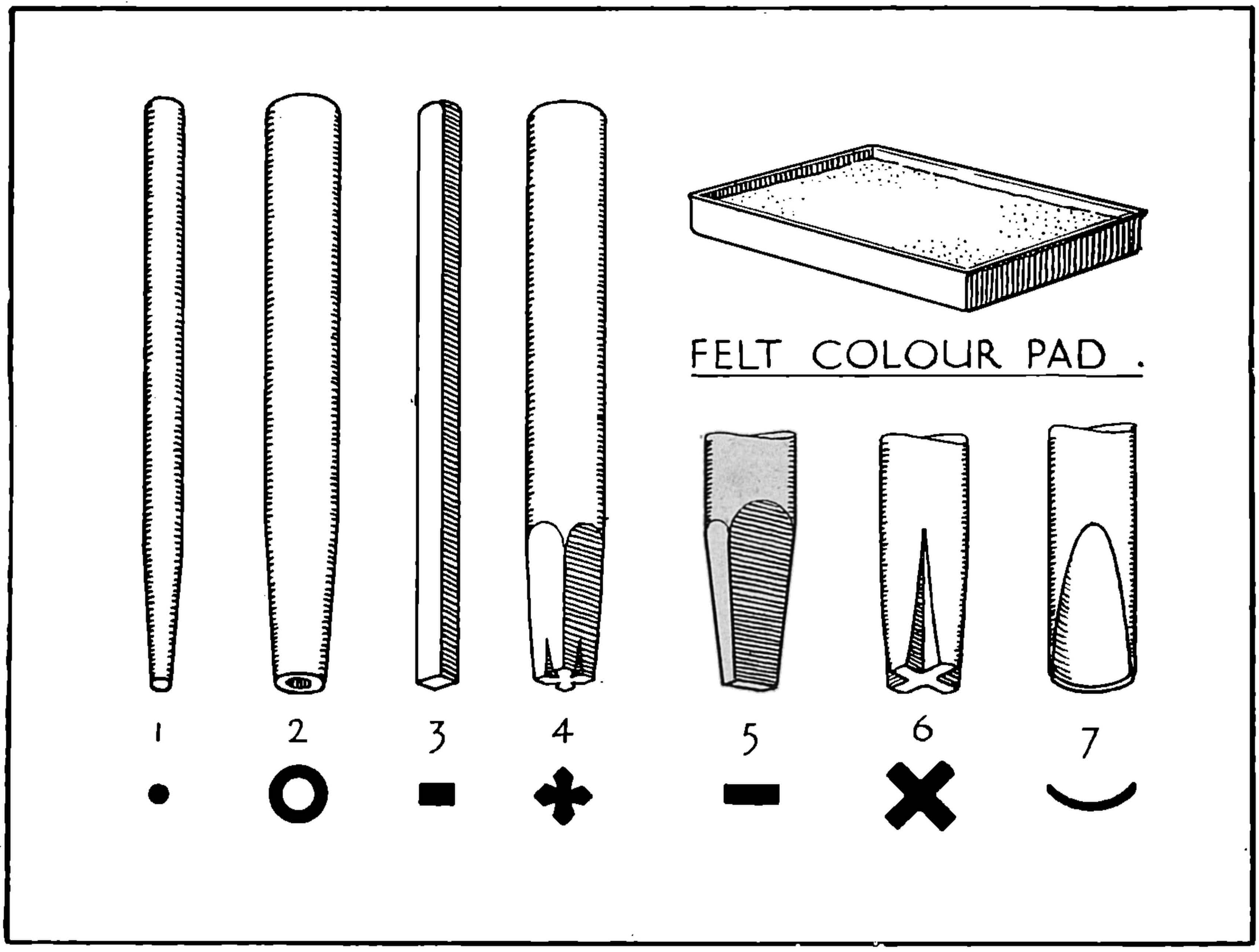


FIG. 4
STICK PRINTING

The paper on which the printed pattern is to be made should be laid upon a drawing board padded with felt or blotting-paper, or even with old newspapers. The inked stick is applied with a firm, square pressure of the hand, then lifted clear, and the result should be a clean print. The stick is re-inked for each impression: a little unevenness of colour may be seen, but in the resulting design this is no disadvantage, as it imparts that pleasing element of variety often to be seen in hand work. If a large area is to be

covered it is advisable to draw, very faintly in pencil, a series of guiding lines to help in the correct placing of the stick.

Plate I shows a few examples of the type of design which stick-printing can produce. The process is particularly suitable for small articles, such as book covers and end-papers. Much delightful work of this type is produced in Italy for these purposes. Here it is a very old craft, and many of these Italian printed papers are being produced to-day from the original blocks which have been in the possession of the same family for over a hundred years.

POTATO PRINTING

Blocks for pattern printing may also be prepared from the ordinary potato. Owing to its cheapness and the great ease in cutting, potato blocks are especially suitable for junior classes. The potatoes, of a medium size, should first be either scrubbed or peeled and then cut in half. This cutting is the only part of the work likely to cause trouble, as the two cut faces should be perfectly flat, in order to give plane printing surfaces. The half-potato can then be trimmed to a square or rectangular form, a pattern cut with a penknife on the flat side, and the block is ready for printing. Plate II indicates the way in which the potato is cut and the type of pattern it is possible to produce.

In printing, the natural moisture in the potato is a great help in holding the colour; water-colour or inks are used as in stick-printing and are applied in the same way for each impression.

PATTERN PRINTING FROM LINOLEUM AND WOOD BLOCKS

The "block" cut from a potato is not suitable for really serious or permanent work; a better method is to cut the unit on the surface of a linoleum or wood block, and for school purposes the former is much the easier to handle.

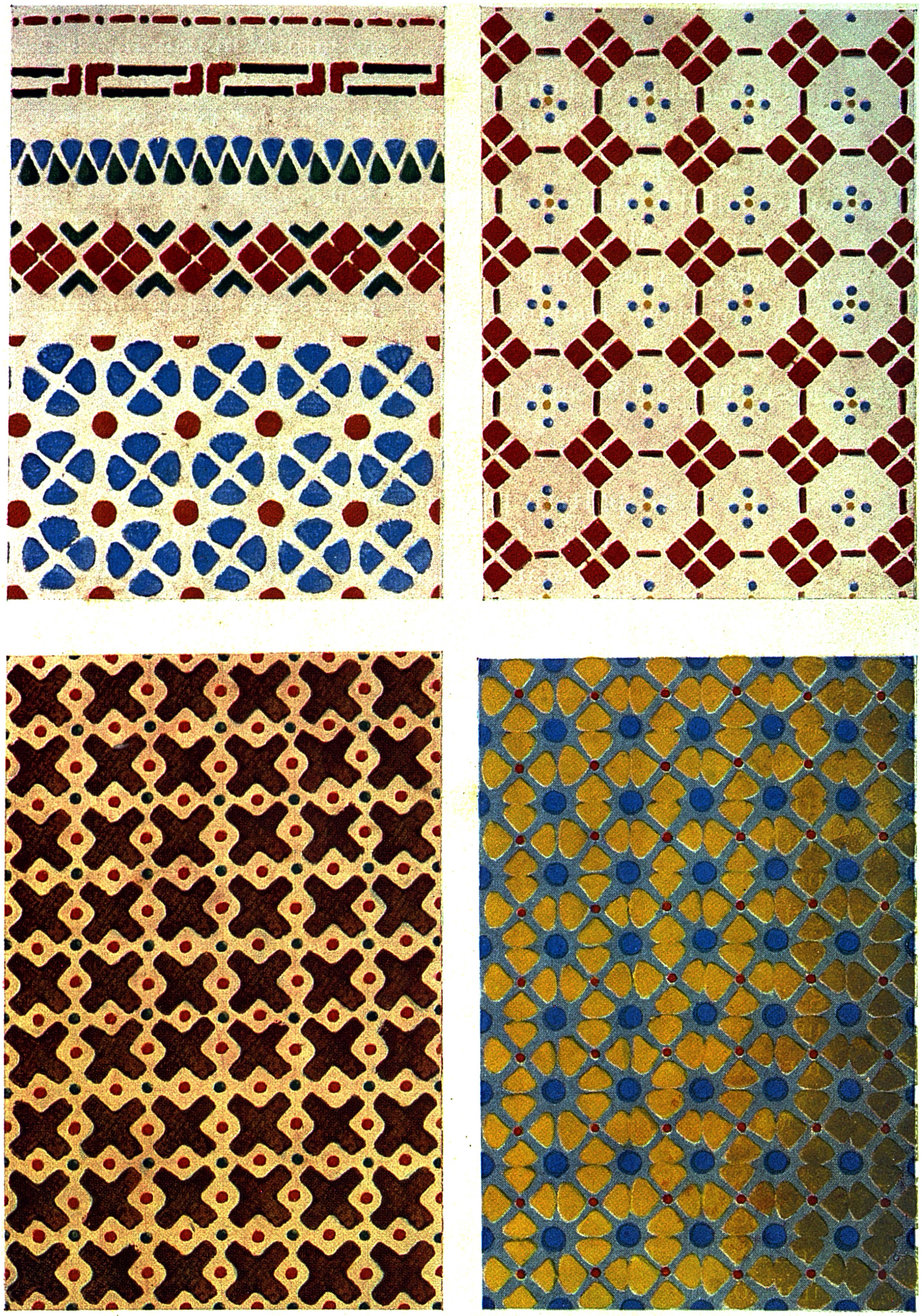


PLATE I

SPECIMENS OF STICK-PRINTING

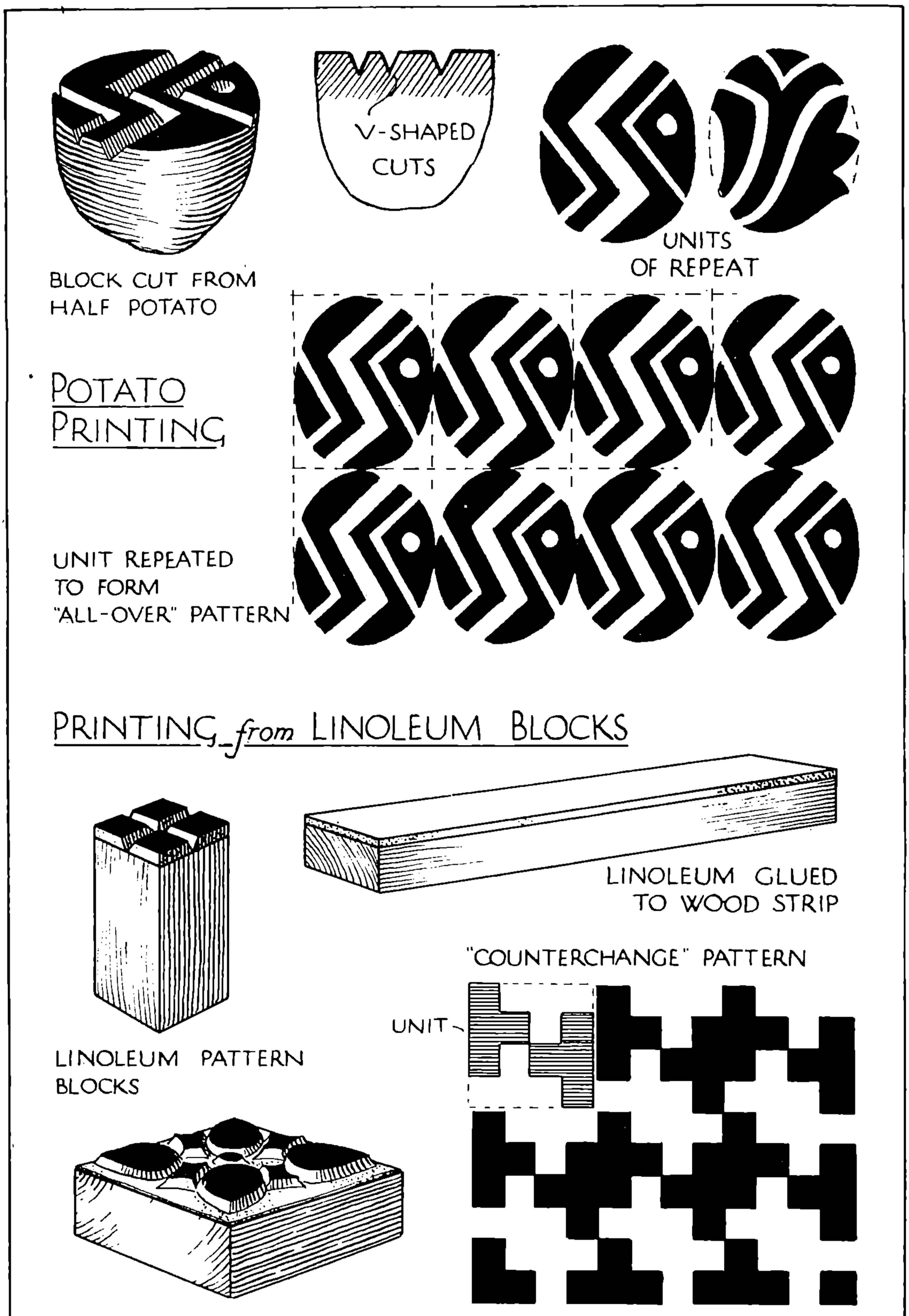


PLATE II
PATTERN PRINTING

LINOLEUM FOR PRINTING PURPOSES. Since the use of linoleum is advocated considerably in the pages which follow, it would be well at this stage to settle upon the most suitable kind for our purposes. For all general work, a plain brown linoleum of good quality and medium thickness (about $\frac{1}{8}$ in. to $\frac{3}{16}$ in.) is the most suitable. It should be firm but not hard in texture; certainly not spongy—for which reason cork linoleum is unsuitable. It is not difficult to obtain the right kind of linoleum, and if any appreciable amount of work is contemplated it is worth while to buy a couple of yards from a house-furnisher, rather than pay fancy prices for small pieces at art dealers, or rely on odd pieces (which are rarely of the most suitable material) brought in by the children. For the small blocks necessary for pattern printing, strips of linoleum varying from $\frac{3}{4}$ in. to 2 in. in width should be glued under pressure to lengths of wood. When applying pressure, either by means of weights or cramps, see that there is nothing in the way that will mark or injure the face of the linoleum. When dry, the strips may be cut with a small tenon saw into blocks of suitable size (see Plate II).

PREPARATION OF THE DESIGN. The unit of repeat must now be designed. From their experience in cutting potato blocks and from experimental tool-cuts on odd pieces of linoleum, children will soon realize the limitations of the material. That is, they will realize that the design must consist of fairly broad masses, any work in fine line being impossible, or at the least, unsuitable. Once this is realized, almost any form, so long as it fits conveniently into a repeat "net," will do. The design should be prepared on paper, filled in with ink or colour, and a few repeats tried out with tracing paper in order to get some idea of the general effect.

When the design has been made, it must be transferred (in reverse) to the face of the block. The linoleum block is

first painted over with a wash of chinese white, a pencil tracing of the design taken, turned over on to the block and pencilled through. In order to avoid any confusion or mistakes in cutting the blocks, the printing portions should be painted black and the cut-away parts left white.

In cutting with the knife (a sharply-pointed penknife is as useful as any) a cut is made all round the outline of the design, and sloping away from it; this is followed by another cut parallel to the first and about $\frac{1}{8}$ in. from it, and sloping inwards to meet it. It will be seen that when this has been done the whole shape is enclosed by a V-shaped incision. The ground (the white portion of the print) can then be cleared away with gouges. This sloping cut results in a much stronger block than one in which vertical cuts have been used.

Cutting a Block with Gouges. An alternative method, and one which may be preferred after experiment, is to go round the design with a V-tool instead of the knife, and again clear the ground with gouges. This method is quicker than the knife, as the V-shaped trench is removed in one operation. It is perhaps not quite so accurate, but is, in its way, more direct—and directness is a quality much to be desired in the resulting print.

In practice a combination of these two methods is often used. In the actual cutting, it will be found that the easiest method is to move the block round with the left hand to a convenient position, and to keep the direction of the cutting tool fairly constant.

The linoleum, either before or after cutting, must be mounted on a wooden block conveniently shaped for printing by hand. The method of printing is then exactly similar to that previously described for stick-printing, i.e. inking by means of a colour pad or by brushes, and then impressing the block on to the paper. An alternative is to use printers' ink, either in black or colour. This must be

rolled out well on an ink-slab (see Chapter VIII) and applied to the printing surface with a composition roller.

Printing on Fabrics. An interesting development of pattern printing in schools, especially for girls, is its application to the decoration of fabrics. The material chosen should be of a thin, even texture, such as *crêpe de Chine* or silk. Cottons or linens can also be printed with delightful effect; they should, however, be washed free from dressing before printing. It is hardly possible in schools to use the chemical *mordants* which are really necessary in the production of printed fabrics, but an effective substitute will be found in the specially made fabric-printing inks now sold by the leading artists' colourmen. Artists' oil-colours, coloured inks stiffened with paste, and the ordinary household dyes have also been used with success. The fabric should be stretched (but not over-stretched) and pinned down to a well-padded drawing board before printing. Experiments might also be made in "flocking" the surface of the block. Professional printers give a matt surface to the block—which assists in holding the ink—by coating it with a waterproof adhesive such as gold size, and dusting a fine flock over it, the surplus afterwards being knocked off. Printed fabrics may be made "fast" to some extent by careful ironing through damp cloths, finishing off without the cloth.

Repeating Patterns. In using the unit to form surface pattern, there are many schemes of arrangement or *nets* upon which the repetition may be based. Plate III shows some of the more commonly used nets. No. 1 shows the simplest; the unit is repeated side by side to form a border pattern, sometimes with the horizontal effect emphasized by enclosing the pattern between a pair of parallel lines or bands. The same method of producing border patterns could, of course, be used round the circumference of a circle. No. 2 is another quite simple arrangement: the

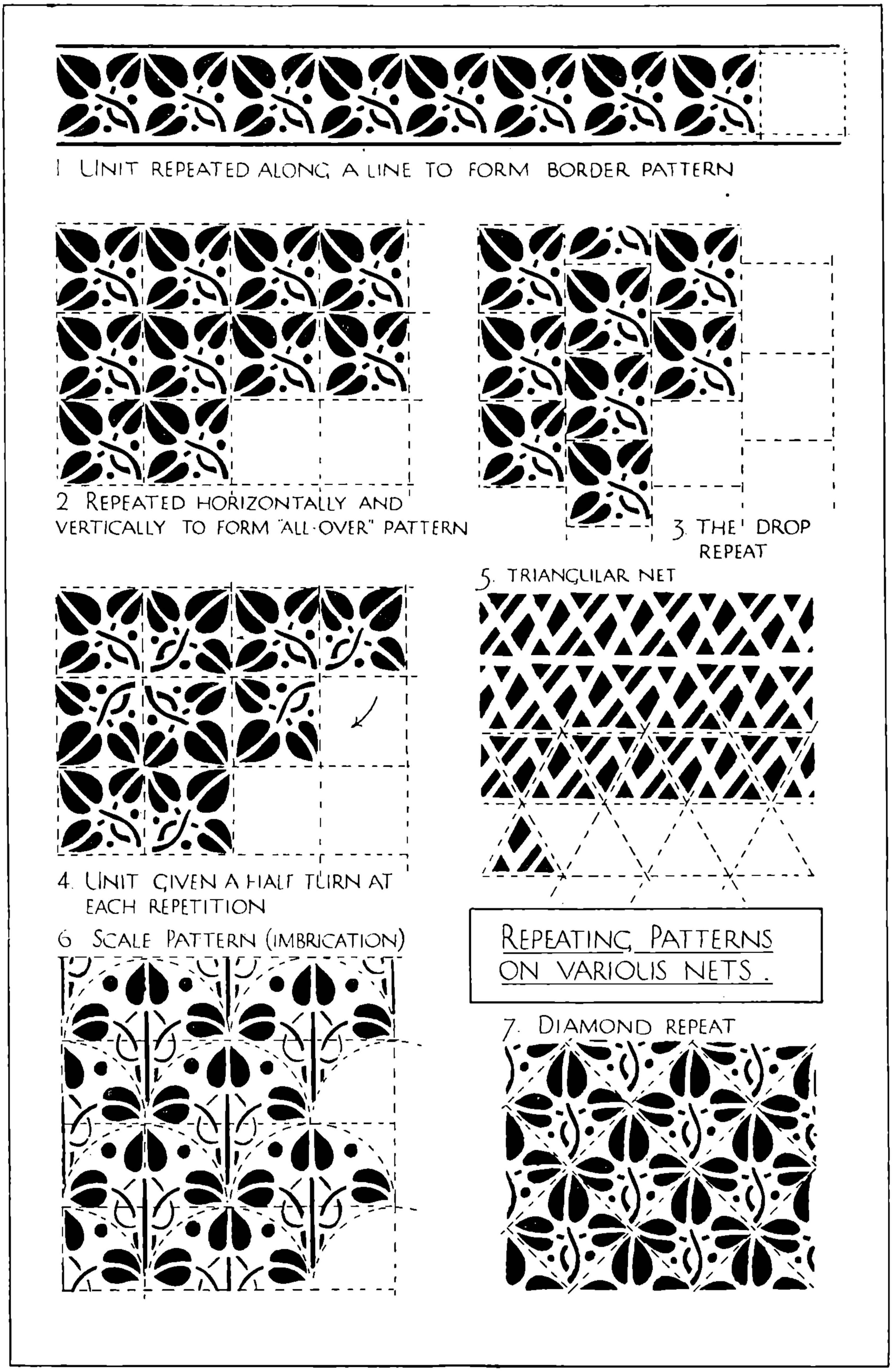


PLATE III
REPEATING PATTERNS ON VARIOUS NETS

unit is repeated horizontally and vertically to produce the all-over effect shown. A variation of this arrangement would be to print only the alternate squares—in the manner of a chequer or draughtboard—and either to leave the remaining squares blank or to use a smaller unit, perhaps in another colour, as a contrast.

What is known as the "drop" repeat is shown in No. 3. The units are printed as before, but in each column are dropped half-way, so that they are level with each other only in alternate columns. The same movement of the repeats may be used horizontally, producing the effect of courses in brickwork. In No. 4, the ordinary square net is again used, but after printing the block is given a half-turn before the next impression. This results in another unit four times the size of the first. No. 7 shows the original unit printed on a diamond net, which is really the same as the square one but is viewed from a different angle.

The triangular net used in No. 5 is often productive of very interesting results from the simplest of units; while the all-over pattern shown in No. 6 is designed upon a net made up of semicircles, resembling in effect the scales of a fish and known as *imbrication.*

CHAPTER III

PICTORIAL PRINTING

As a medium for pictorial expression, within its limits, and particularly for school purposes, printing from linoleum blocks has much to recommend it. It is a development during recent years of the older craft of wood-engraving, and offers a much more tractable and quickly-worked material, the employment of which results in a somewhat different technique. From the nature of the material, a linoleum-cut must be carried out in broad masses of light and dark; a great deal of line work is neither possible nor desirable. As an exercise in the simplification of a drawing into its broad essential masses of light and shade, it is a healthy corrective to the more or less outline convention of pen and pencil drawing.

FIG. 5

In all forms of artistic expression the medium employed plays a very large part in the final result, which should reflect honestly the possibilities and peculiarities of that medium. The basis or unit of a pencil drawing is a line; of a water-colour drawing, a more or less liquid wash; of an oil painting, touches of thick paint, and so on. In linoleum printing the unit is the print obtained from a piece of linoleum, on the surface of which tool-cuts have been made, producing, in the print, white lines or spaces. This is the principle underlying what is known in lino-cutting, wood-cutting, and wood-engraving as the "white line method."

This is the easiest and most direct method of expressing

form in a lino-cut. If the illustrations (Figs. 5, 6, and 7) are studied, these points will be clearly seen. Fig. 5 is an ordinary line drawing, such as would be made in pen or pencil, from a group of objects. Fig. 6 shows the same group interpreted as a linoleum-cut by means of white line—a good method of preparing the design is to draw it with chinese white on dark card—this having the same effect as a blackboard drawing. The third example (Fig. 7) shows the same subject treated as "black upon white." In this last example it will be noted that all detail has been eliminated from the drawing, and the composition resolved into broad masses of three tones—black, white, and grey. This middle or grey tone is often produced by a series of lines.

FIG. 6

FIG. 7

MATERIALS AND TOOLS. The question of material was largely dealt with in the previous chapter. It may be well to mention here, however, that there are various grades of linoleum, and for serious work trial should be made of as many varieties as possible, so as to choose the most suitable for any particular purpose. If, for instance, rather more detail than usual is desirable, there is a hard, thin kind of linoleum which may be useful. Although, as indicated previously, much useful work can be done with a pocket knife, good tools are at all times a great incentive to the best work, and the illustrations on Plate IV show some

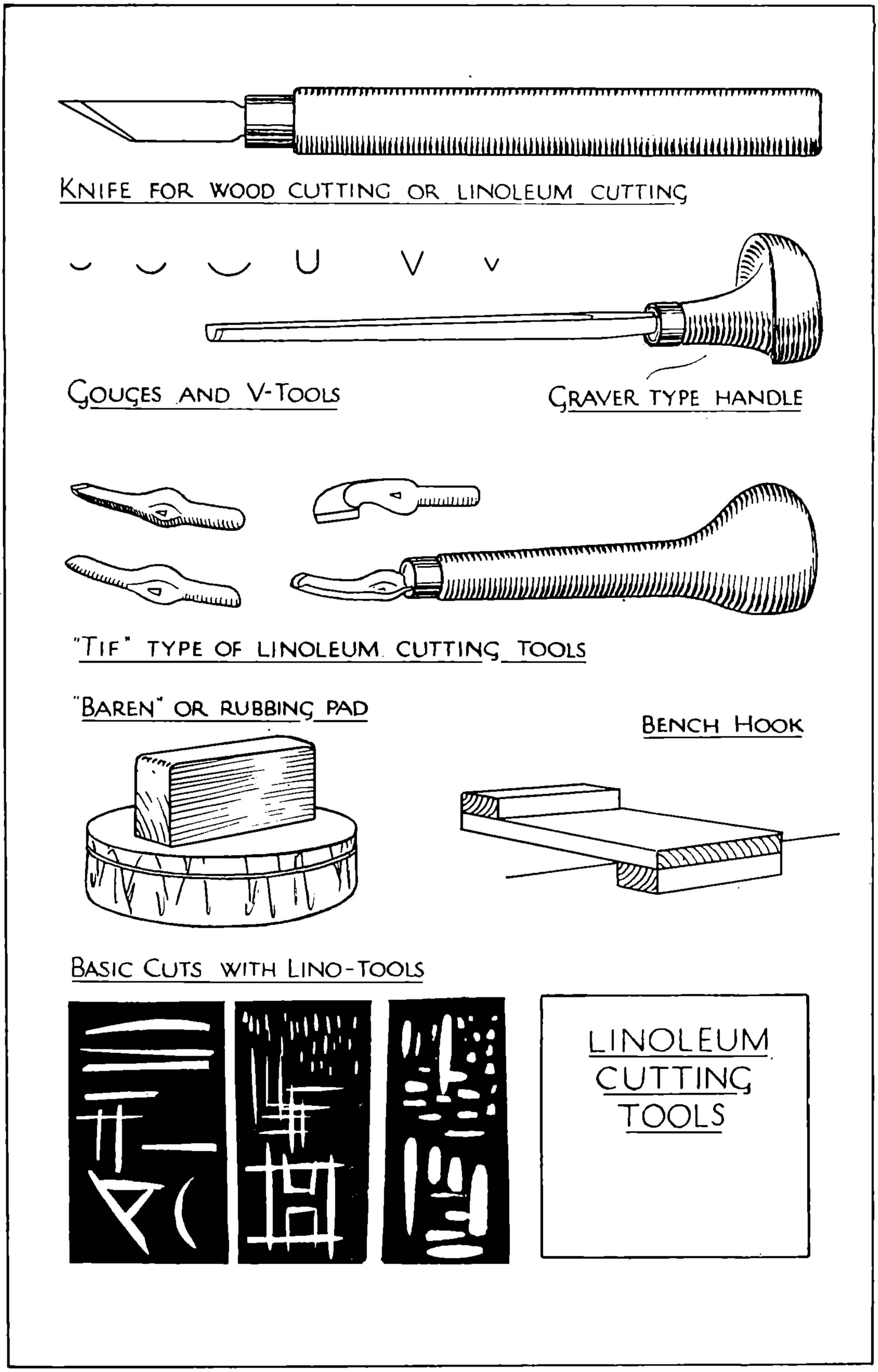


PLATE IV
LINOLEUM CUTTING TOOLS

of those available. One or two really good gouges and V-tools set in graver handles are delightful to use. In recent years, special lino-cutting tools with interchangeable cutters (after the fashion of a penholder) have appeared on the market, and are certainly very useful. A bench-hook, against which the linoleum block can be placed whilst cutting, is a desirable addition. For hand-printing from the blocks, some kind of rubbing pad (in Japanese colour printing termed a *baren*) is needed. The *baren* used by the Japanese is a circular pad of about 5 in. in diameter, with a rubbing surface of ribbed bamboo sheath. An effective substitute is, however, illustrated in Plate IV. This consists of a circular disc of wood, to which a piece of leather is glued. Across the face of this leather a number of parallel grooves are cut with a gouge, giving a ribbed effect. Stretched over this again, and secured above with fine tacks or pins, is a piece of tracing linen. With a small block of wood added as a handle, this makes a serviceable pad. A small piece of hardwood, polished by friction, also makes a simple and useful rubbing pad.

DESIGNING THE PRINT. This is perhaps the most difficult part of the whole process. A well-designed linoleum print needs as much skill and knowledge in its preparation as that required for design in any other medium. The impression is often conveyed that, left entirely to themselves, children are naturally artists. While not denying that—with young children especially—there is often evidence of a delightful freshness of vision and freedom from convention, a large proportion of their efforts results in little more than crudity; and a crude linoleum-cut is no more attractive than a crude drawing in pencil or in any other medium. It has not been the experience of the writer that the "leave it entirely to the child" attitude is productive of the best and most satisfactory results; definite teaching and the assimilation of as many good examples of

work as possible are as necessary as ever. The first exercises in linoleum-cutting might well be from designs supplied by the teacher, or designs adapted from suitable magazine advertisements. Even in the later stages, although lacking the interest of original work, such "translations" from line or photographic illustrations are not without value, and sometimes produce quite interesting prints. Fig. 8, for

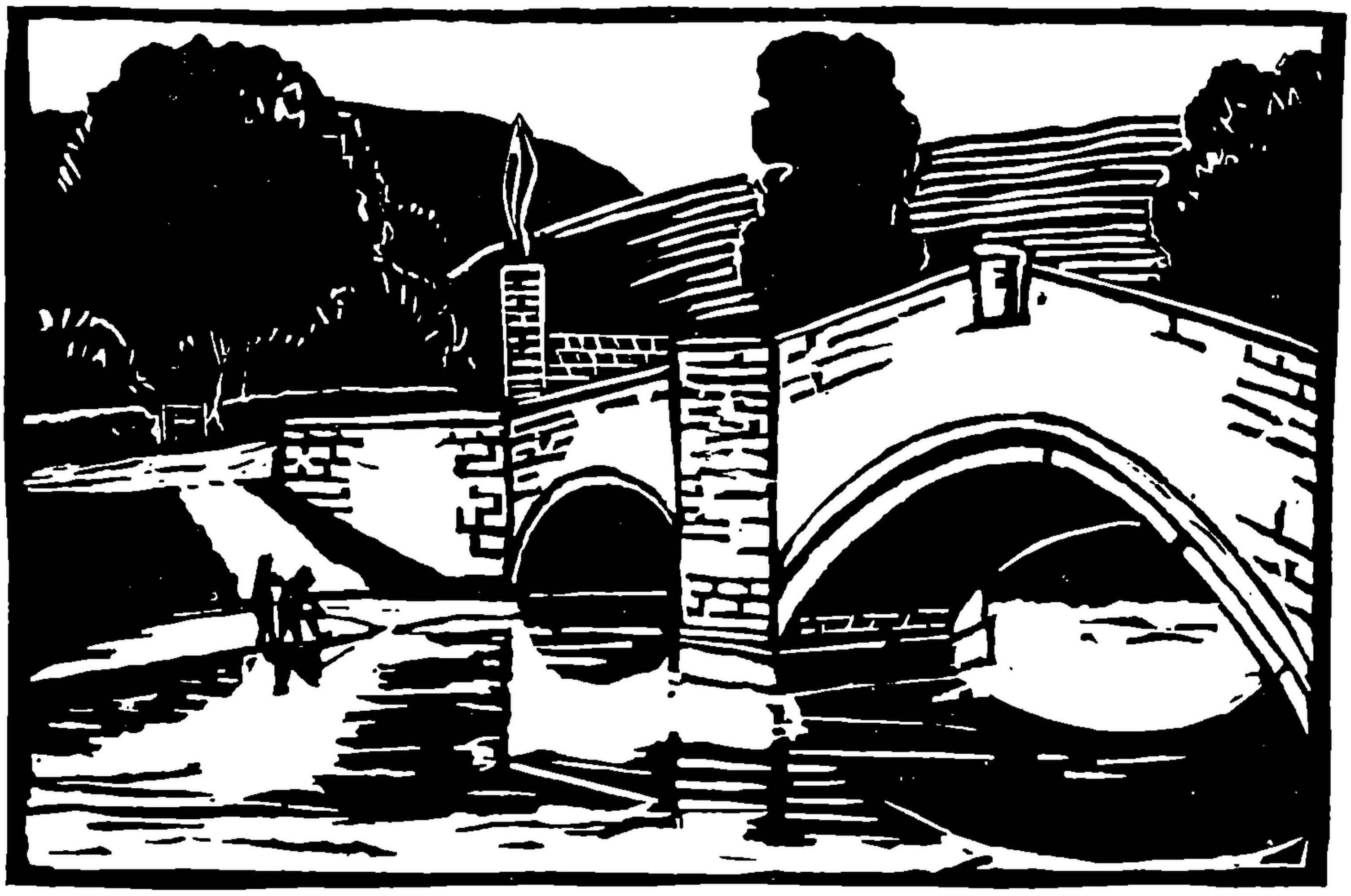


FIG. 8. *The Bridge*
LINOLEUM-CUT BY J. JARMAN

instance, was based upon a picture post-card of Llanrwst Bridge, and was designed and cut by a boy of 15. The linoleum-cut shown by Fig. 9 was suggested by a newspaper photograph, where the bright sunlight had naturally arranged the subject into well-defined and well-balanced masses of light and shade; its suitability for the medium was recognized by the boy, who subsequently cut and printed it. The danger, of course, lies in allowing the pupil to remain at this stage, and in not encouraging him to go on and produce really live, original work. In this latter part of the work a useful connecting link can be established with the imaginative drawing and illustration work which is—

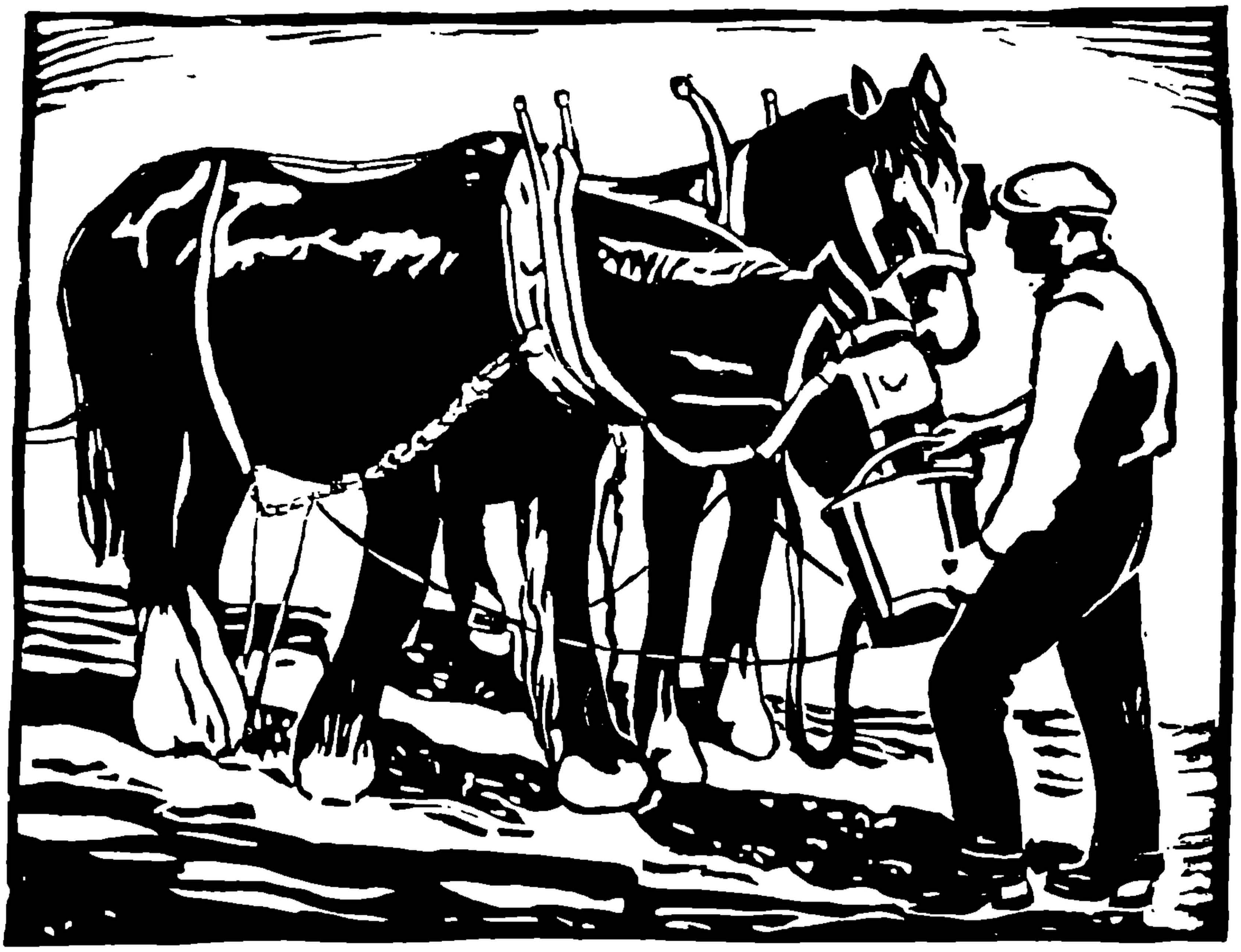


FIG. 9
LINOLEUM-CUT "TRANSLATED" FROM NEWSPAPER PHOTOGRAPH BY A. WEST

FIG. 10. *The Workshop*
ORIGINAL LINOLEUM-CUT DEVELOPED FROM IMAGINATIVE DRAWING BY E. WHITE

and rightly so—a feature of modern art teaching. *The Workshop*, reproduced in Fig. 10, was the unusually successful result of carrying the memory and imaginative drawing a stage further by turning it into a linoleum-cut. For those pupils with less aptitude for this type of work, successful cuts can often be made from groups of still-life,

FIG. 11. *Cheddar Gorge*
LINOLEUM-CUT BY BOY OF 15

as in Fig. 7, especially if the lighting be arranged to produce clear-cut lights and shadows.

It is clear that the pencil, making as it does fine lines, is an unsuitable tool for the designing of linoleum prints. A better way is to provide brushes and water-colour, black and white, with which the design is to be made. Opportunities should be taken of pointing out that in good prints there is a certain balance between the masses of black and white, and that there is always a "pattern" to be found in good compositions. There is a unique opportunity in this type of work of demonstrating many of the underlying principles of pictorial composition.

CUTTING THE BLOCK. Before the design can be cut it will be necessary to transfer it, reversed, to the surface of

the block. The following method has proved very satisfactory in practice: the linoleum is first painted over with a fairly strong wash of chinese white. Should the surface be at all greasy, repelling the colour, it should be rubbed lightly with fine glasspaper. While the white is drying, the design must be reversed, so that in printing it will appear identical with the original. This is especially necessary if the design contains any lettering. A simple way of doing this is to place the drawing on a sheet of carbon paper, with the carbon side in contact with the back of the design. If the outlines of the latter are then pencilled over with a hard, sharp pencil, the reversed design will appear in carbon on the back of the original, which is then pinned in position on the whitened block (with the reverse side uppermost), carbon paper interposed and the outlines once more traced over with a sharp pencil. If this is carried out carefully, a clear carbon outline will be found traced on the block. To prevent mistakes in cutting, the design should be painted in with black colour, and then all is ready for cutting.

FIG. 12
LINOLEUM-CUT

The same method of cutting is used as for pattern-printing blocks: a V-shaped trench is cut round the black areas, and the whites cleared out with a gouge. When the cutting is completed, the block should be cleaned with a sponge and carefully wiped dry ready for printing.

PRINTING. There are two methods of printing linoleum blocks: by hand, and in a printing press. The latter method will be dealt with more fully in a later chapter, so that here we are mainly concerned with printing by hand.

MESTON TRAINING COLLEGE,
ROYAPETTAH, MADRAS.

Here, again, in hand printing we have the choice of two methods: to use as our medium either water-colour or printers' ink. Each has an attraction of its own, and experiments should be made with both. The paper used for taking prints—*proofs* is the more correct term—should be thin, and fairly absorbent. For the best work, Japanese

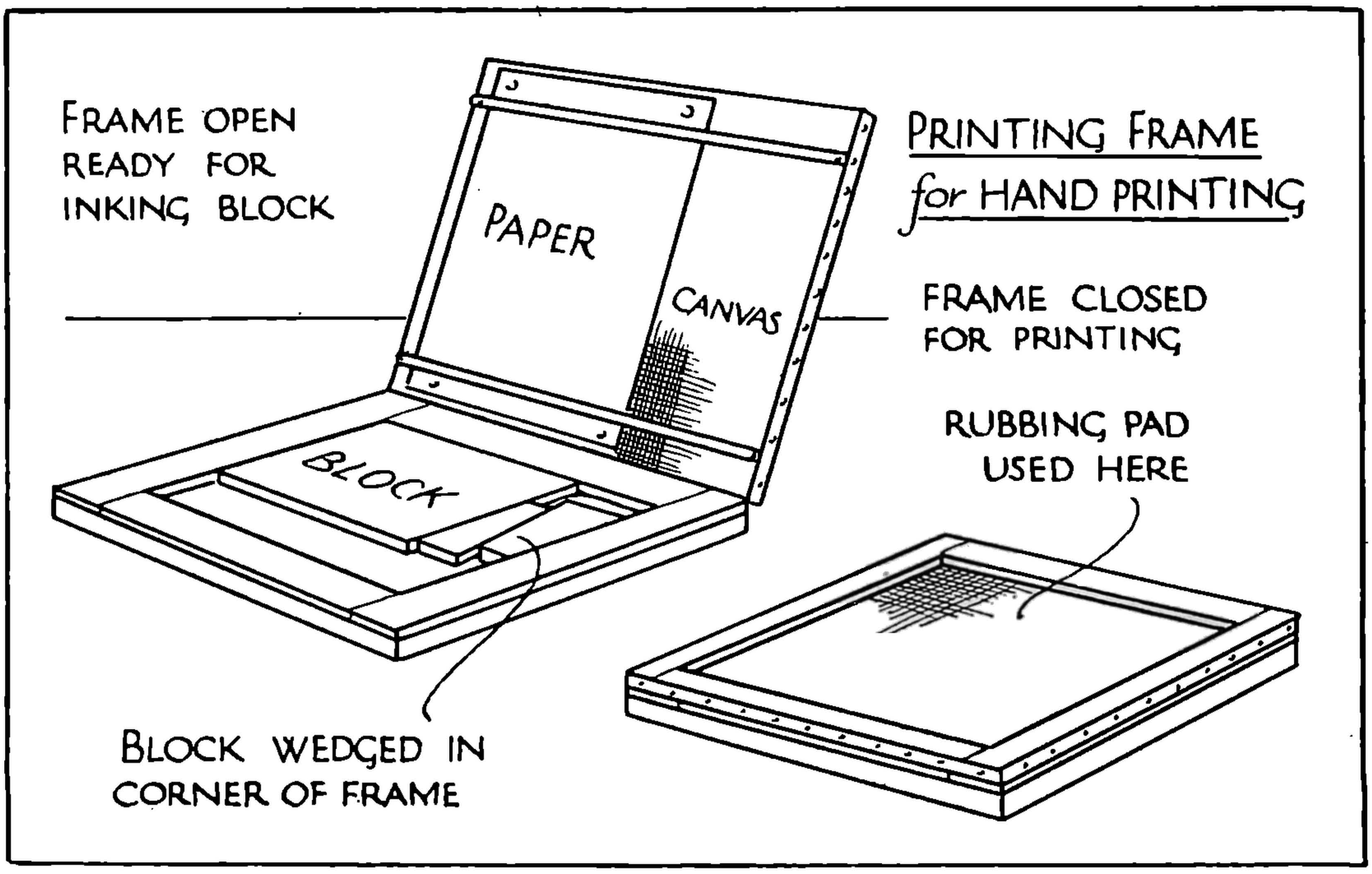


FIG. 13
PRINTING FRAME

paper is ideal, but for all ordinary work a thin typewriting paper, or, if printers' ink is being used, a plain, smooth-surfaced writing paper is quite suitable.

The use of a simple frame for printing is to be strongly recommended. Fig. 13 gives an indication of the type of frame necessary, and one which is quite easy to make. A baseboard of about 10 in. square (this is big enough for most work) has strips of three-ply wood nailed round its four edges. A lid, consisting of an open frame over which canvas is stretched tightly, is hinged at the back.

For printing, the block is wedged into the corner of this frame, as shown in Fig. 13. The paper to be printed upon is

secured to the lid either by drawing pins or by being slipped beneath the elastic bands. The block is then inked. If water-colour is used, it should be stiffened with a little paste or gloy and applied to the block with a fairly wide, flat brush. If printing ink is used, a rubber photographic roller —or better still, a composition roller—is employed for applying the ink to the block. A little of the ink, which is obtainable in tubes, is rolled out on an inking slab—for which purpose a piece of plate-glass is excellent—and from this is applied in a thin film to the block.

The block being inked and the paper in position, the lid is closed down upon it, and the impression taken by rubbing the back of the canvas. Begin this rubbing lightly, with a circular motion, and gradually increase the pressure. To obtain a good proof, especially if there are any fairly broad masses, needs considerable pressure. When it is felt that sufficient impression has been given, the lid may be lifted carefully and the proof inspected. If it appears faint in places, re-ink the block where necessary and, without moving the paper, make a fresh rubbing. It is in this possibility of deepening the colour, and in its great advantages in the registering of colour prints, that the printing frame proves of value. The process above described may be repeated as many times as proofs are desired, the block being cleaned occasionally if the ink or colour thickens on it.

Colour Printing. The introduction of one or more colours other than black greatly enlarges the scope and interest of linoleum printing. It is possible, if the design is suitable, to produce a colour print from one block only, by inking different parts of it with varying colours; but usually, two or more blocks are necessary. The four examples shown in Plate V indicate the type of colour prints it is possible to produce in schools. No. 1 was not, strictly speaking, a colour print at all, although the design is eminently suitable for such a purpose. It formed part

PLATE V

of the cover design for the programme of a Christmas party. It was printed in black only, and distributed to the children for filling in with water-colours. This method forms an easy approach to colour printing. The remaining examples on Plate V were, however, colour prints, each one being produced from two or more blocks. As a typical example, the cutting and printing of No. 2, the bowl of fruit, will be described.

The original design was prepared from an object drawing, the subject being very suitable for production in simple masses and flat tones. The finished print, it will be seen, is made up of six colours: black, yellow, blue, green, orange, and brown. Had it been intended to reproduce the design in the printing press instead of by hand, six blocks would have been necessary; one for each colour. In hand printing, however, it is possible to print two or more colours from the same block; and this example was actually produced from four blocks (as shown in Plate VI) which printed respectively, yellow; blue and green; orange and brown; and black.

The chief difficulty in colour printing is to obtain what is known as correct *register* in the various blocks; i.e. when printed, each colour patch must appear in its correct position without overlapping or showing white gaps. The use of a printing frame, such as that previously described, makes this registering a fairly simple matter. First of all the necessary blocks are prepared, four pieces of linoleum being mounted on three-ply wood, allowing a fair margin round the design—and all finished square and to the same size. Care should be taken to see that the top left-hand corner of each block is quite square so that it will fit correctly into the corner of the printing frame. Each block is then coated with chinese white ready to receive the design for its particular part of the final print. What is known as the key-block, usually in black and white, is first prepared and cut.

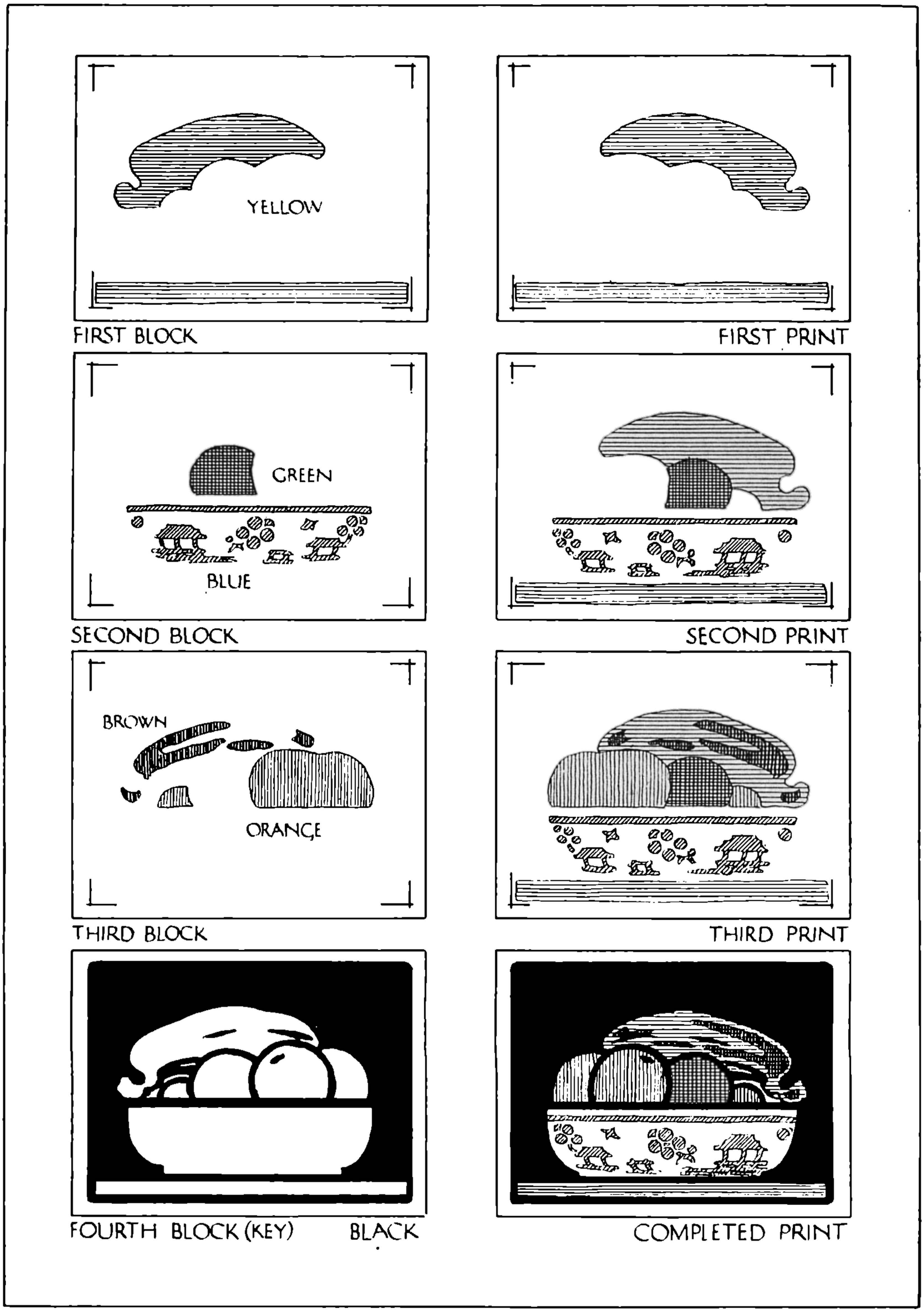


PLATE VI
STAGES IN COLOUR PRINTING BY HAND

A print is taken in the printing frame in the manner previously described. As a guide to the cutting of the remaining blocks, this first print should be coloured in with water-colours. The designs for the remaining blocks are obtained by what is known as the "offset" method. A piece of paper is placed in the printing frame, and pinned securely in position. The key block is inked, fairly generously, with printers' ink applied with a hand-roller. The block is wedged into the corner of the printing frame and a print taken by rubbing. It should be seen that this first proof is a good and well-inked print. The key block is removed from the frame *but the paper is not.* The second block is wedged into the corner of the frame; the fresh print, with ink still wet, is brought down on it and a rubbing made. This will leave the reversed impression of the key block on the white surface of the second block. The other two are treated in the same way. It is then a simple matter to fill in, with the brush, the colour patches for each block and to carry out the necessary cutting. Where the block contains some more intricate work, and is not a simple colour patch, as in the willow pattern for the blue print, a tracing from the original design and reversal into its correct position on the block will have to be made.

PRINTING FROM THE COLOUR BLOCKS. Here, again, the printing frame is invaluable. First of all the work-table should be arranged conveniently with the paper, colours, separate brushes for each colour, and all materials likely to be needed, ready to hand. Damping the paper is often recommended, and for the advanced worker certainly produces better results, but for ordinary school work this introduces, in the writer's opinion, an unnecessary complication. It is essential to decide upon the order of printing. In the bowl of fruit, for instance, it is obvious that the brown patch must be printed after the yellow, since it is to be superimposed upon it; and the last block to be

printed is the key block—the black—as it helps to mask any little irregularities in cutting or register. Actually, the order of printing was yellow, blue and green, orange and brown, black. Each block is inked, placed in the frame, printed, and replaced by the next block until the finished

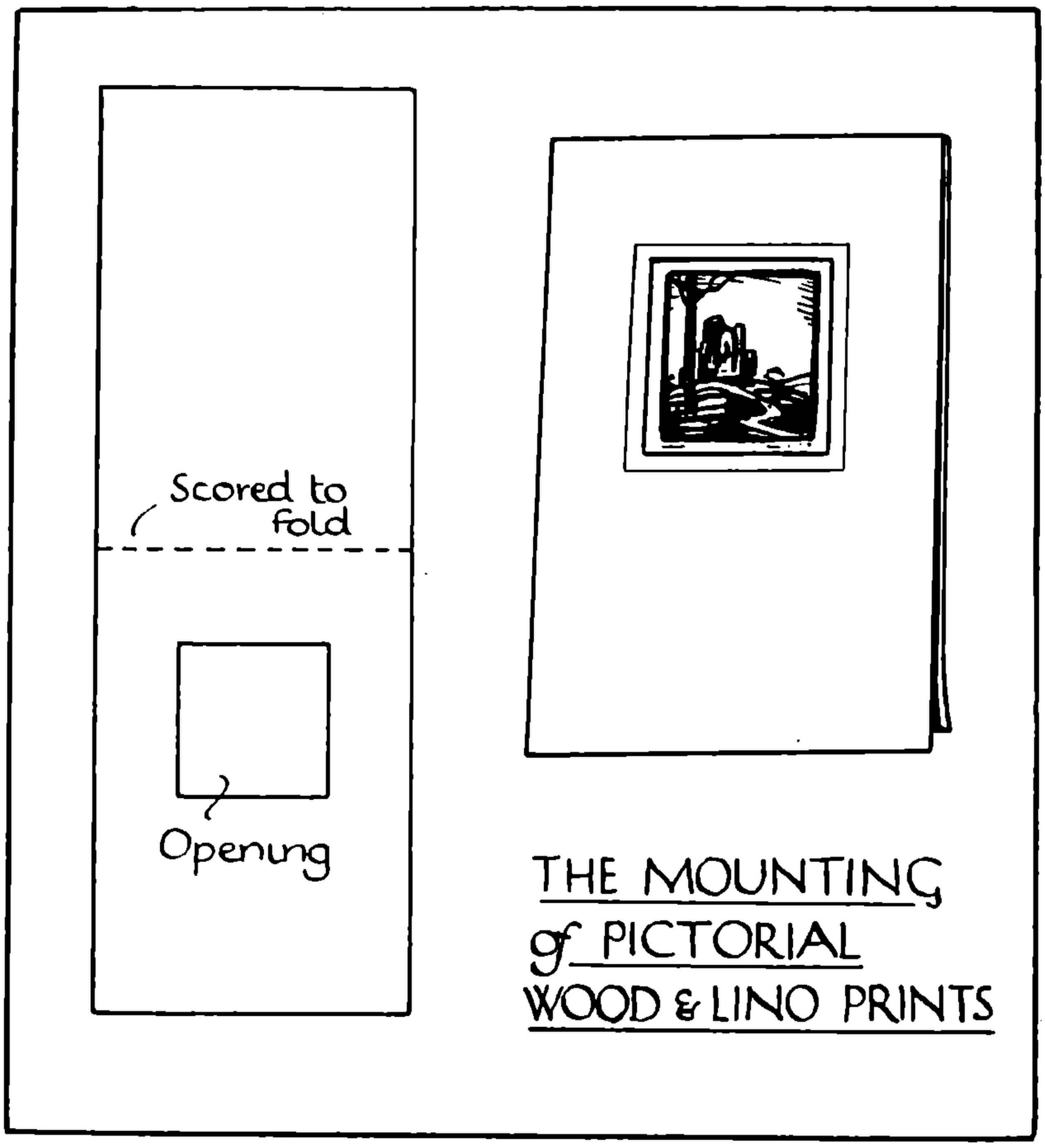


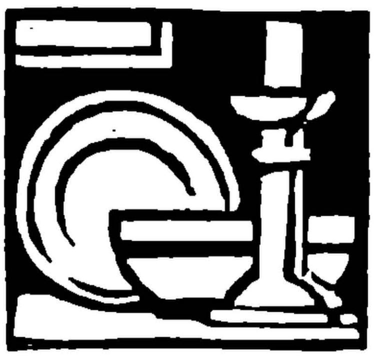
FIG. 14

print appears. Then the whole process is gone through again as many times as prints are required.

It may be mentioned that the colour prints on Plate V were produced in gouache (poster colours), applied to the blocks with a brush, while the key block was printed with black printers' ink.

THE MOUNTING OF PRINTS. When dry, the finished print should be mounted, with a generous white margin all round, in the same way as is usual with an etching. A piece of mounting board or stiff paper is cut twice as large

as the finished mount; and then folded in two (see Fig 14); an opening through which the print appears is cut in the front half, and the print itself is mounted by means of small pieces of gummed paper on the back. The whole print should never be stuck down, but secured along the top edge only. An examination of Fig. 14 should make clear this method of mounting. A further step would be to frame the mounted print in *passe-partout*, the finished production often making a good wall decoration.



CHAPTER IV

WOOD-CUTS AND WOOD-ENGRAVINGS

ALTHOUGH, for school purposes, linoleum is undoubtedly the most suitable material for use in the production of pictorial prints, experiments should be made in the older and more difficult crafts of wood-cutting and wood-engraving, at least by the more advanced pupils. It should be clearly understood that, as they are used here, the terms wood-cutting and wood-engraving stand for two quite different processes; and the resulting prints are readily distinguishable one from the other by anyone familiar with the work.

A wood-cut is carried out in almost exactly the same way as a linoleum-cut, the only difference being that the design is cut upon the surface of a piece of moderately hard and close-grained wood, such as maple, satin walnut, or cherry. Of these, satin walnut is probably the most easily obtained for school use. A piece of the size necessary should be cut from a board of suitable thickness, and the surface planed perfectly flat and smooth. The design is transferred to it in the same way as for a linoleum-cut. The cutting also is carried out in very much the same fashion, except that the fibrous nature of the grain calls for better and sharper tools, more physical effort, and a certain amount of experience in order to obtain good, clean results. Owing to the harder nature of the material, a little more detail and finer lines are possible than in linoleum-cutting; but, generally, the design should still consist of broad, easily-cut masses of light and dark. Printing can be carried out either by hand or in a press. Fig. 15 shows a wood-cut, originally part of an advertisement for evening classes in handicraft at a men's institute. It was cut with

knife and gouge on a piece of type-high maple, set up with type and printed in the press.

WOOD-ENGRAVING. This process is quite different from the above, the essential difference being that the picture is not cut with knives and gouges upon what is known as the "plank" side of the wood, but it is engraved upon the end-grain surface of specially prepared pieces of boxwood.

FIG. 15
WOOD-CUT

Before the days of process work and photo-engraving, wood-engraving was the only means by which books and magazines could be illustrated; and, in the middle of the nineteenth century, some very excellent work (at least from the technical point of view) was produced. There has been, in recent years, a revival of wood-engraving as a graphic art, particularly as a "white-line" method, the earliest exponent of which was Thomas Bewick, who illustrated his nature books with many excellent engravings.

The prepared end-grain surface of the boxwood is very hard and close-textured, and cuts can be made upon it with

a graver with equal ease in any direction. The work calls for a high degree of skill and patience, but that is no reason why some small "cuts" should not be attempted in schools. Because only the end-grain is used, and the box tree does not grow to very large dimensions, this wood is obtainable only in fairly small pieces. In the old days of full-page wood-

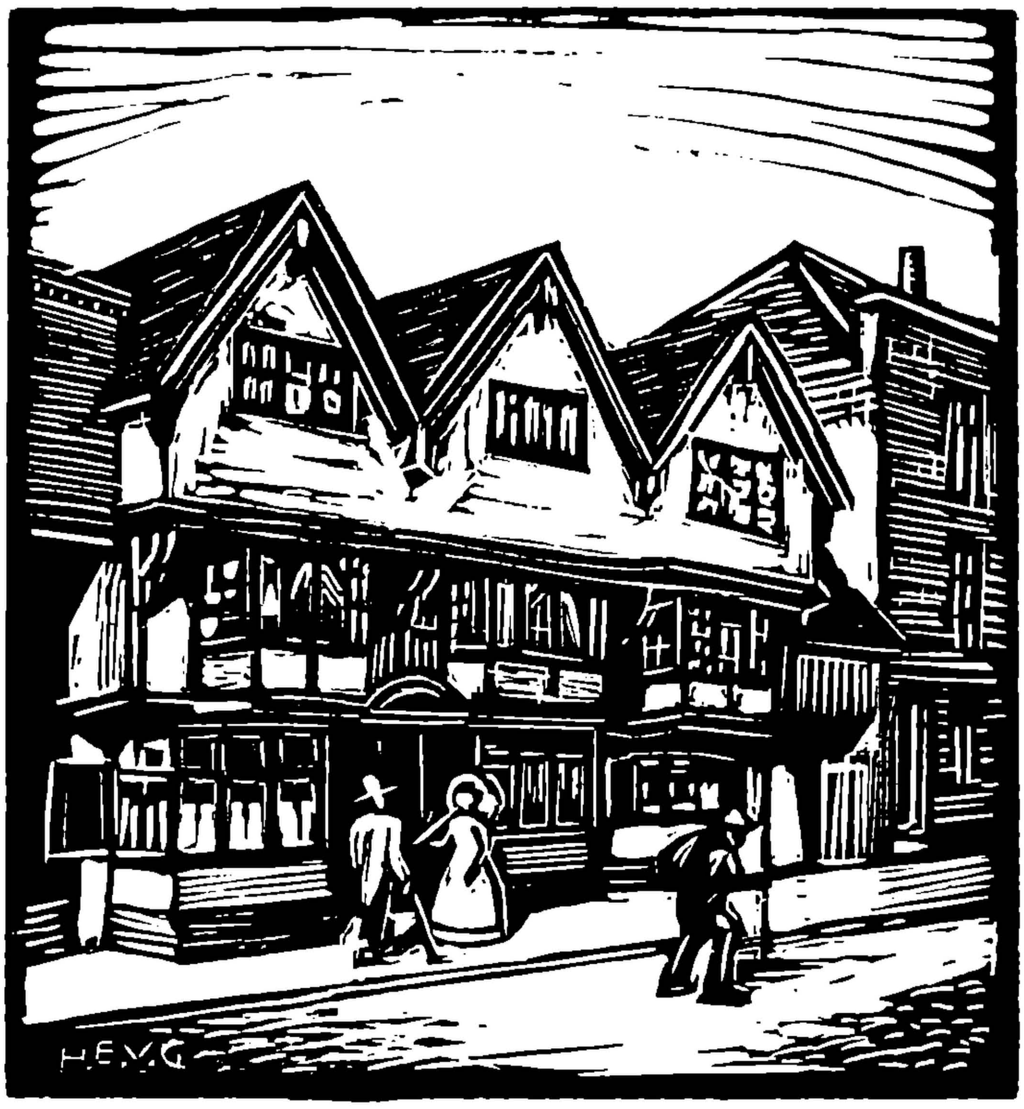


FIG. 16
WOOD-ENGRAVING

engravings this difficulty was overcome by very carefully joining and keying the small pieces together. Indeed, in much of the old magazine work, the blocks were put together, drawn upon by the artist, taken apart again and distributed among various engravers in order to expedite the work. A very interesting room devoted to engraving and printing generally is to be found in the Victoria and Albert Museum at South Kensington.

For experimental purposes, a few small pieces of prepared boxwood should be obtained, and three or four varied gravers. A thin wash of chinese white should be

applied to the block, and the design traced and painted on it. A considerable amount of practice is necessary with the various gravers on the backs of the blocks. During the process of engraving, the block is held and turned about on a sandbag with the left hand, while the whites are cut away by means of the graver or scorper held in the right. Some considerable practice may be required before even

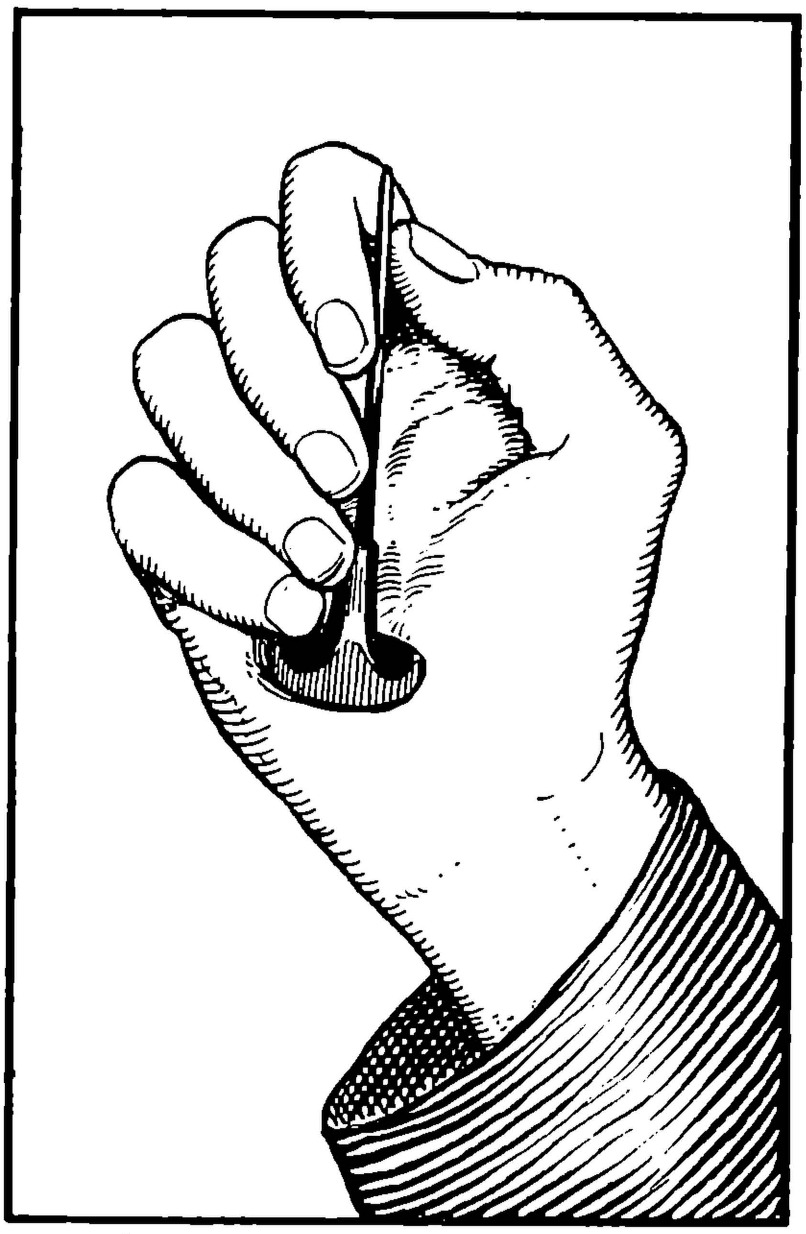


Fig. 17

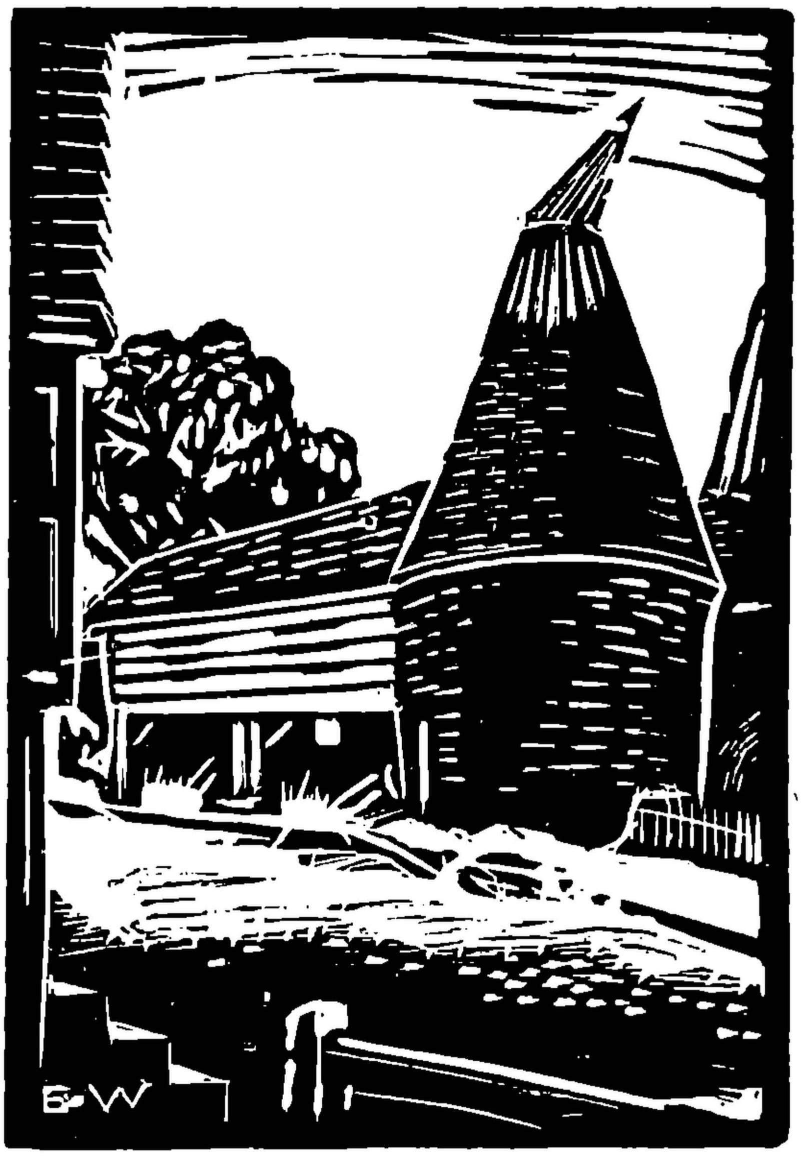


Fig. 18
WOOD-ENGRAVING

the method of holding the graver is mastered (Fig. 17), and, where possible, the right hand, which is doing the cutting, should be held lightly in check by the fingers of the left, in order to obviate the possibility of a slip. When the cutting is finished, the block is cleaned and is then ready for printing. Wood-engravings are never printed with water-colour—as are linoleum-cuts or wood-cuts. For experimental purposes during the process of cutting, a print may be rubbed off by hand, but the

finished print is always made in a press, printers' ink being used.

Wood-engraving is a craft particularly useful where there is a school press, as illustrations and decorations produced in this way usually harmonize with the surrounding type, and have much more individuality and freshness than those produced by other means. For decorative or purely pictorial prints made for mounting and framing, proofs are usually made upon thin Japanese paper—a limited edition is printed and each proof is signed and numbered in pencil below the print.

Fig. 16 is a reproduction of a wood-engraving used for illustrating a school journey pamphlet; while the print shown in Fig. 18 is from an original wood-engraving by a central school boy of 15.

Plate XVII (on page 117) is a reproduction of a larger engraving intended for use as a wall decoration, and shows clearly the difference in quality between a wood-engraving and a linoleum-cut.

CHAPTER V

LETTERING

THE study and practice of the best forms of lettering should form part of every scheme of art instruction, but such study is especially necessary where a course of craft work, based on printing, is contemplated. It is not proposed to deal exhaustively with the art of lettering—many excellent books on the subject are already in existence; we are mainly concerned here with lettering as it influences printing. It is obvious that, since the major quantity of printed matter consists of the reproduction of letter forms, some knowledge of, and standard of taste in lettering is of vital importance. The power to appreciate really good forms of the Roman alphabet is essential if the best work is to be produced in letterpress printing, such as that suggested in the later chapters of this book.

Lettering practice should be begun with a simple form of alphabet drawn in pencil—a skeleton type based on the classical forms derived from the best Roman inscription work, such as that of the Trajan Column, which is regarded as the prototype of fine lettering. This perfectly plain but characteristic lettering (Plate VII) is the most useful and legible of all, and is suitable for nearly all purposes where lettering is required. The same alphabet can be elaborated by the addition of tails or "serifs" (see No. 2, Plate VII). In addition to the capitals, both the *lower case* alphabet and the numerals should be constantly practised.

When this basic form, which is suitable for most school purposes, has been mastered thoroughly, another important stage in the study of lettering is the acquisition of a formal handwriting by means of a broad pen. In connection with printing, this is an especially valuable study, since most of

LETTERING STUDY

BUILT-UP PEN CAPITALS

1 ABCDEFGHIJKLMMN
OPQRSTUVWXYZ & 52

BASIC ROMAN TYPE

2 ABCDEFGHIJKLMNOPQRSTUV
WXYZ abcdefghijklmnopqrstuvwxyz :

ROMAN TYPE WITH SERIFS ADDED

3 SCRIPT WRITING AND LETTERING WITH A BROAD PEN. Practical study of this will lead to a knowledge of good letter forms and an appreciation of the best type faces.

4 LETTERING SUITABLE
5 FOR LINOLEUM CUTS:
6 BRAGGADOCIO 21

PLATE VII

the forms in modern type were originally derived from the manuscript books written before the invention of printing. These old books, often fine examples of craft work, were written with a quill pen cut to a broad end, or, occasionally,

FIG. 19
LETTERING CHART

and for larger work, with a reed pen cut in the same way. Interest has been revived, in recent years, in this craft of fine writing—mainly through the work and teachings of Edward Johnston and Graily Hewitt. Detailed instructions in writing and lettering with the broad pen are to be found in many books on the subject, the standard work being Edward Johnston's *Writing, Illuminating, and Lettering*. While for the finest work a well-cut quill pen is still the best instrument, there are many steel pens now on the

market which are excellent for all ordinary study. An interesting combination of formal writing and printing from a linoleum-block is seen in the rhyme-sheets illustrated in Plate XVI (page 104).

In addition to these exercises, the really fine forms of the best Roman inscription letters should receive as much study as time will allow. Attention should also be directed, not only to the original Roman work, but to some of the best modern lettering which follows the classic forms. Fig. 19 shows a teaching chart used in connection with lettering study. This was drawn on an imperial size sheet of black card and painted in white, and was based upon letter forms designed (by F. C. Herrick) for use in the British Empire Exhibition at Wembley in 1924–25.

In Plate VIII is shown a specimen of incised stone lettering by Eric Gill; this is published as one of four lettering sheets by the authorities of the Victoria and Albert Museum, South Kensington.

In the study of lettering as part of the art course, opportunity will arise for pointing out that the best work entails not only the reproducing of the fine and often subtle form of each letter, but that much depends upon careful spacing and the arrangement of the lettering in mass. In other words, we have the feeling for design and pattern arising again, as it must do in every branch of the art teaching. The training received in this earlier study will be especially valuable later on in arranging the *lay-out* of matter to be set up in type.

LETTERING FOR LINOLEUM-CUTS. Any lettering which forms part of a linoleum-cut should be characteristic of the medium, i.e. it should be bold in character, avoiding fine lines; and should be somewhat angular in form, the natural result of knife-cutting. Although metal type may be assembled together with the block, and the whole printed in a press, where it is possible—and the amount of lettering

Victoria and Albert Museum

PLATE VIII

PANEL OF HOPTONWOOD STONE, WITH INSCRIPTION CUT BY ERIC GILL

is not excessive—it is best to include it as an integral part of the design. In this way, if the whole is a direct result of knife or gouge cutting, a much more homogeneous *ensemble* will result. Fig. 20 shows such a cut—a design for the cover of a programme—in which it will be seen that lettering, if there is not an undue amount of it, can be effectively produced in a linoleum print, either as black upon white or *vice versâ*. Care must be taken, of course, that any lettering is cut in reverse upon the block.

FIG. 20
LINOLEUM-CUT

An interesting application of linoleum cutting to the study of lettering is in the design and cutting of single initial letters with decorated backgrounds, which may be printed in black or a bright red or blue (Fig. 21).

The lettering shown in the lower examples on Plate VII illustrates the kind of faces which would harmonize with a linoleum-cut when it is used in conjunction with metal type—bold, simple lettering which would be of somewhat the same "weight" as the accompanying cut. Nos. 4 and 5 (Plate VII) are excellent faces to use with linoleum- or wood-cuts; No. 6, also selected from the pages of a printer's specimen book, is good, but tends perhaps towards the affected and the *bizarre*. In all questions of lettering and selection of type faces, legibility, simplicity, and adherence to traditional form should be the main criteria.

FIG. 21
LINOLEUM-CUT INITIAL LETTER

CHAPTER VI

LETTERPRESS PRINTING

AN HISTORICAL NOTE. Printing, "the art preservative of all arts," has been claimed as the most important single mechanical revolution in human history; and probably no other invention has had so profound an effect, not only upon the material life of man, but upon that larger world of thought and ideas. The invention of printing from movable types, coupled with the scarcely less important developments in the art of paper-making, stimulated enormously the intellectual growth of the western world. "The invention of the art of printing was one of the events which put an end to the Middle Ages."

". . . the intellectual life of the world entered upon a new and far more vigorous phase. It ceased to be a little trickle from mind to mind; it became a broad flood, in which thousands and presently scores and hundreds of thousands of minds participated."[1]

The art of taking impressions from carved wooden blocks was imported from the East as early as the sixth century. These early prints were in the form of pictures, but later it was found equally possible to reproduce lettering, although it was a long and tedious process; and the next important stage was the cutting of separate letters in the form of small blocks or types, which could be set up into any form desired and used again and again. The final stage, the use of metal instead of wood for type, was reached, apparently both in Germany and Holland, between the years 1440 and 1450. The name usually associated with the invention is that of Gutenberg of Mainz. Germany certainly seems to have been the cradle of the new art, and from Mainz,

[1] H. G. Wells, *Outline of History*, Chapter XXXV, § 3.

due in part perhaps to the sack of this city in 1462, the use of the printing press spread first down the Rhine, then to the further parts of Germany, later to France, Italy, and England, and eventually over the whole western world.

Its introduction into England was due to William Caxton, a merchant of the City of London. Much that we know of his early life is learned from the records of the Mercers Company, of which he eventually became a member. In 1463 he was appointed Governor of the Merchant Adventurers of the Low Countries and settled in Bruges. He apparently made a special visit, extending over a year (from 1471 to 1472) to Cologne in order to learn the details of this new art and mystery. On his return, in collaboration with Colard Mansion, a calligrapher, he established a press at Bruges. Eventually he returned to England, and set up his printing office in the Almonry of Westminster Abbey. The first book that he produced here was *The Dictes and Sayengis of the Philosophres*, finished on 18th November, 1477.

In these incunabula only the body of the text was printed, and only one fount of type was used. Printing replaced the laborious method of copying out books in the scriptorium, and it can be imagined that the new craft was not regarded very favourably by the great number of calligraphers and illuminators whose work became unnecessary. These craftsmen, however, were still employed in decorating the printed page by illuminating and *rubricating* (the insertion, usually in red or some other bright colour, of initial letters or *versals*).

It was not long before it was realized that by printing these initials and decorations from carved or engraved wood blocks, a much more homogeneous result could be obtained at less expense; and thus began the illustration of books, and the use of blocks set up with type and printed in one operation.

LETTERPRESS PRINTING

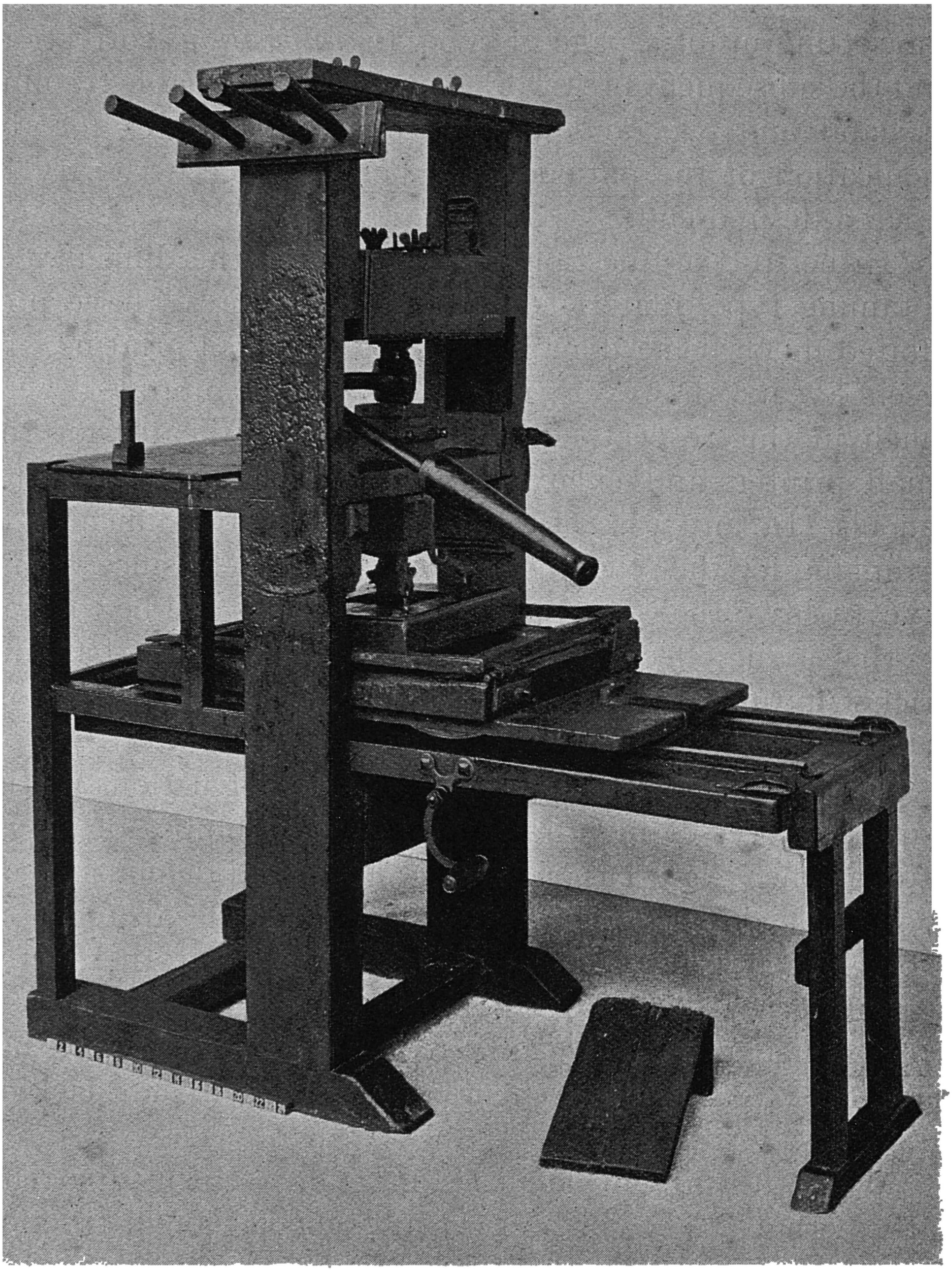
The centuries between 1450 and 1800 saw little real change in the art of printing. Indeed, some of the works from the earliest presses—notably Gutenberg's 42-line Bible of 1455—have never been surpassed as examples of beautiful typography. Developments in the design and cutting of type took place in various countries, especially in Italy and in France, but during the eighteenth and nineteenth centuries the standard declined, and was at a very low ebb, with certain notable exceptions—such as the faces produced by the English houses of Caslon and Baskerville, which still occupy a very high position in the modern typographical world.

But the form of the press itself scarcely changed at all during these centuries. The old press illustrated on Plate IX, one used by Franklin in the eighteenth century, probably differed very little from that used by Caxton. The craft of printing, however, was caught up and swept along in the general mechanical revolution of the eighteenth and nineteenth centuries, and the form gradually changed from the old hand-press to the modern high-speed newspaper press capable of producing 60,000 or more copies an hour.

Yet all these recent advances—not only in printing machines, but in the methods of composing, for much of the modern type-setting is done mechanically by linotype or monotype casters and setters—leave the essentials of the craft unchanged. The best work, from an artistic standpoint, may still be done—and often is done—on the small hand-press.

LETTERPRESS PRINTING IN SCHOOLS

Printing, as it is usually understood, i.e. the setting up of metal type and taking impressions by means of a press, is a craft which is not yet very widely practised in schools. Yet it presents a very desirable extension of the more commonly-met crafts of pattern printing and pictorial



Victoria and Albert Museum

PLATE IX
CAXTON-TYPE PRINTING PRESS

printing from blocks, and the possession of a hand-press greatly enlarges the scope and interest of the work. Further, the setting up of a page of type, its *imposition*, correction, and the subsequent presswork, constitute a valuable training of hand and eye, and afford ample opportunity for the inculcation of the patience and perseverance necessary to reach a desired end.

Hitherto, the question of expense and the difficulty of obtaining type, materials, and a suitable press, have prohibited much being done in the way of school printing. In recent years, however, conditions have improved very much in this respect, and many firms now cater for the small printer, and even give an appreciable discount to schools. In any case, there should be little difficulty in arranging for the school press to pay for itself, since within a year or two the cost of press and materials will be covered by the saving effected in tickets, programmes, football and cricket fixture cards, etc., the need for which arises in most schools.

Obviously it is not possible to give instructions in the various processes in printing to a large number of pupils at one time. An occasional general talk and demonstration is possible, but normally the pupils must be arranged in groups, each group being engaged upon one or other of the various types of work described in these pages. If these groups change over from time to time, it will be found that the whole constitutes a scheme which at least is not lacking in interest for the pupil.

With the present facilities in many schools (particularly perhaps in senior and central schools) for instruction in woodwork and metalwork, it is possible to save a considerable amount of money by the construction of many of the various tools and accessories necessary in printing. It has, indeed, been found possible—though it is not always desirable—to make, by the exercise of a little ingenuity

and skill, everything necessary for school printing except the actual type and spaces. Where this construction of home-made apparatus is at all possible, suggestions are given in later pages as to the various methods which could be adopted.

The type of work it is possible to produce on the school press is limited only by the size of the press and the skill and enthusiasm of the printer, but among the varied output of one such press may be cited: tickets and programmes for sports days, for open days, for prize days and concerts; letter and postcard headings; fixture cards for football, cricket, and for netball; poems and extracts for the English lessons; book-plates and rhyme-sheets; descriptive leaflets for school visits; and, as more ambitious projects, school journey guide-books and the school magazine.

The materials necessary for printing may be brought into three main sections: the press, the type, and the materials and accessories used to assemble the type ready for the press. The selection or construction of a school press needs a chapter to itself, so that here we need only deal with what must of necessity be purchased, the type.

Type. Printers' type is very accurately cast in an alloy of lead, antimony, and tin, known as type-metal. The effect of the antimony is to produce a metal which has the unusual property of expanding slightly upon cooling, which enables sharp, clean castings to be made. In the first place, the letter characters are cut in the form of a number of steel punches—an operation calling for very highly-skilled work on the part of the die cutter. Matrices are then made from the punches in soft copper and castings are taken from these for the actual types. Each piece of type is then accurately machined to width, depth, and height. The appearance of such a piece of type is illustrated in Fig. 22, with the names of the various parts. In order to facilitate the work of setting up or *composing*, one, two, or three

semi-circular nicks are cut in the lower edge of each piece of type, the number and position varying with different faces or styles.

Type is cast in varying sizes of body, in conformity with what is known as the *point* system, which is an arrangement of sizes based upon a unit called the point. There

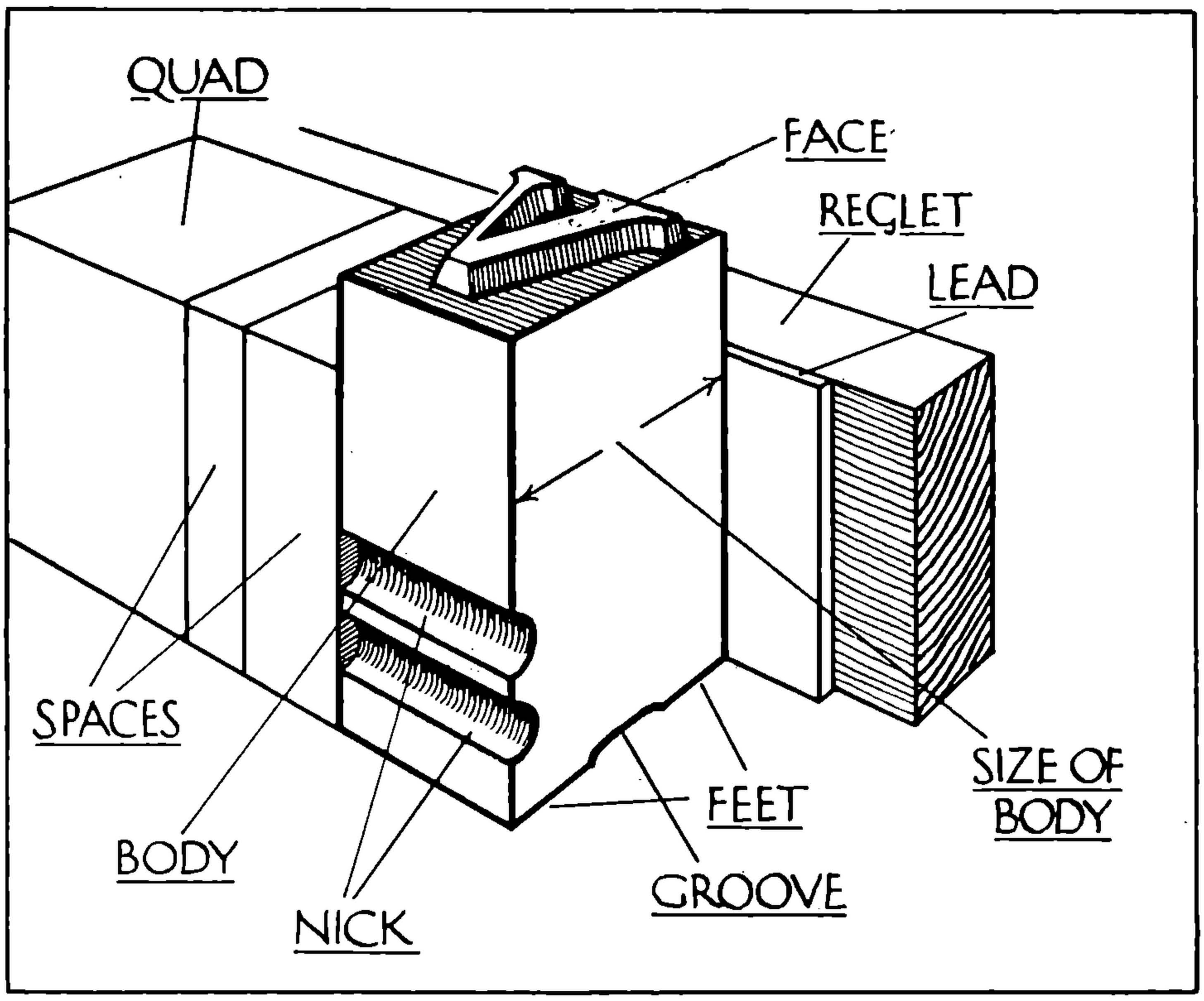


FIG. 22
TYPE AND SPACING MATERIAL

are seventy-two points to the inch, so that six lines of 12-pt. type, nine lines of 8-pt. type, or twelve lines of 6-pt. will make up 1 in. in depth. Type sizes vary (see Fig. 23) from 6-pt. to 72-pt.: larger sizes of type are generally regarded as poster type, in which case they are cut in wood—usually on the end grain of maple. The standard of linear measurement of type—e.g. for measuring the width of columns or pages—is known as the *pica* (an *em* space of the 12-pt. body), which is one-sixth of an inch wide, so that a page 4 in. in width, for example, would be called twenty-four picas wide.

Spaces and Quads. In order that words may be separated and short lines filled up, *spaces* and *quads*, of varying width but of the same depth as type, are needed. They are, of course, lower in height than type, so that they will not print. Spaces are available in six sizes, thus: termed respectively: hair, thin, mid, thick, en and

TYPE used to be ex

TYPE used to be expens

TYPE used to be expensive, gr

TYPE used to be expensive, grandfather

TYPE used to be expensive, grandfather used to hand

Fig. 23
VARYING POINT SIZES OF TYPE (GILL SANS SERIF)

em spaces. Quads are supplied in three sizes, 2-em, 3-em, and 4-em, thus:

Leads. In order to separate or space out (*lead* out) lines of type, strips of white metal known as *leads* are used. They are supplied in lengths of 18 in., and in the following thicknesses: 1-pt., 1½-pt., 2-pt., and 3-pt. These leads must be cut very accurately to the width of the matter it is desired to print; it is best to decide upon two or three standard widths and to get a supply cut to these sizes when ordering. A useful series would be 12 ems (2 in.), 18 ems, 20 ems, and 24 ems; these sizes will meet most ordinary needs, and the cut leads should be kept in an orderly way in a rack or boxes. It is often necessary to cut leads of odd lengths. For this purpose a lead-cutter is an expensive item, but if care is taken to cut accurately, a sharp-pointed knife or scissors may be used. In an emergency, home-made

"leads" may be cut from strips of cardboard, but here, again, unless great care is exercised in the cutting, they are likely to cause a great deal of trouble in the setting-up of type.

REGLETS AND FURNITURE. Thicker spacing materials,

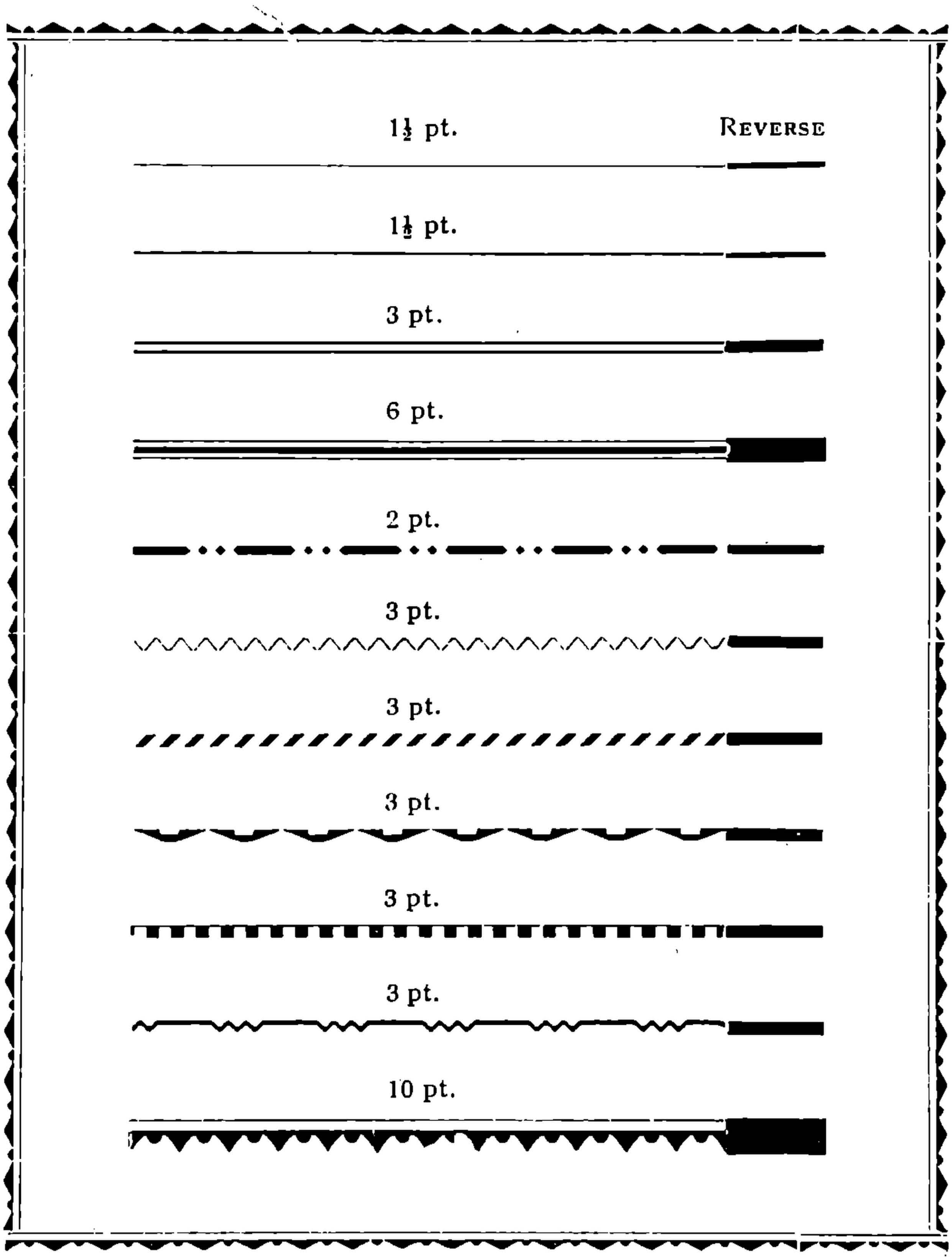


FIG. 24
SPECIMENS OF PLAIN AND ORNAMENTAL RULE

known as *reglets* and *furniture,* are machined from well-seasoned oak or beech, and are made in the following thicknesses: 6-pt., 8-pt., 10-pt., 12-pt., 18-pt., and 24-pt. for reglets, and 36-pt., 48-pt., 72-pt., and 96-pt. for furniture. Both are supplied in 36-in. lengths, and must be cut to size as required by means of a fine saw.

BRASS RULE. When it is desired to print a line, either fine or thick, plain or decorated, brass or zinc rules are used. These are type-high strips of metal made in many thicknesses and designs; they are used singly (as lines or dashes) or in combination, to form borders, dividing lines, or to meet any other case where it is necessary to print a line. Where the line required does not extend across the whole width of the type, such as in a dash, each side of the rule must be filled with pieces of lead of the same thickness. Rules are often used to *box in*, or form a border line round, type matter; and for this, the four pieces must be accurately mitred at the corners. This mitreing is best carried out by machine, but can be done—if great care is used—with a fine file. Specimens of plain and fancy rule are seen in Fig. 24.

FOUNTS OF TYPE. Type for the cases is sold in what are known as *founts*—quantities of type which contain every letter and character used, but not in equal numbers of each letter. The number of types of each letter varies according to the frequency of its occurrence in the English language. All founts, for instance, contain a proportionately greater number of the letter E, while letters like X and Z are supplied in correspondingly smaller quantities. In listing and ordering type the letter A is used as a convenient standard for the size of the fount. A specimen scale fount worked out in accordance with the number of A's is shown on page 51.

OTHER CHARACTERS. There are additional characters which are occasionally necessary, but which are not usually included in a standard fount: such reference marks as the asterisk (*), dagger (†), section (§), paragraph (¶), braces (⏟), fractions, leaders (...), dashes, etc.

ACCENTED LETTERS. These are occasionally needed, and can be obtained to "line up" with any standard book face.

LIGATURES. In book faces, in addition to the characters shown in the fount below, the *ligatures* (or joined letters) ﬁ ﬀ ﬂ ﬃ ﬄ are supplied. These are used because the single f is a *kerned* letter; i.e. part of the character overhangs the type body, making it difficult to compose

AAAAAA BBBBB CCCC DDDD EEEEEEE FFF GGG
HHHH IIIIII JJ KK LLLLL MMMM NNNNNN
OOOOOO PPP QQ RRRRRR SSSSS TTTTT UUU
VVV WWW XX YYY ZZ Æ Œ aaaaaaaaaaa
bbbbbb ccccccc ddddddddd eeeeeeeeeeeeeeeee ffffff
gggg hhhhhhhhh iiiiiiiiiiii jjj kkk lllllllll mmmmmm
nnnnnnnnnnn ooooooooooo ppppp qq rrrrrrrrrrr
sssssssssssss tttttttttttttt uuuuuuuu vvvv wwwww xx
yyyyyy zz æ œ &&& ,,,,,,,,,, ;;; ::: .... '''' --- !!!
?? 11111 222 333 444 555 666 777 888 999 000 ££

FIG. 25
SPECIMEN SCALE FOUNT OF TYPE—12–PT. 6A 12a

with other types, especially "ascenders" like l. Ligatures were once employed much more extensively, short words, such as *the*, *in*, *as*, were once cast as solid types. Some faces still retain the ligatures *ct* and *st*.

TYPE FACES. There are innumerable different *faces* or styles of type from which to choose. Type faces are usually classified in two ways: Roman or book faces for all ordinary straightforward reading matter—the main text of books or magazines—and fancy, titling, or display faces. The ordinary Old Face Roman or book founts contain capitals, small capitals, and lower-case characters, numerals, and all the punctuation marks and signs in English. There is a corresponding Italic face which may be used in conjunction with all Roman faces. Titling and display faces are available nowadays in all sizes and styles. The standard of design in the cutting of type faces has risen enormously in recent

years, as a study of the specimen sheets sent out by the various founders will demonstrate.

In the choice of founts of type suitable for school purposes it would be wise to decide upon two or three faces which will be of most general use, and then to add later, as experience grows, additional founts, the need for which may subsequently be felt. Certainly one of the first founts purchased should be a useful book-letter; and since it is not advisable for children to work with anything smaller than 12-pt., a fount of 12-pt. Old Face Caslon is recommended. A fount of the corresponding 12-pt. Old Face Caslon Italic is also desirable, and a small fount of slightly larger type, such as 18-pt. The best results in typography are obtained when faces of the same design are used throughout any one piece of work, so that this larger type also had better be 18-pt. Old Face Caslon. There are, of course, other excellent titling founts, and the choice will depend finally upon the taste of the purchaser. Another word may be added with regard to the purchase of type—do not have too many sizes. Even if different faces are purchased, try to keep to two or three sizes, e.g. 6-pt. for occasional small type, and 12-pt. and 18-pt. for general use. By this means all spaces, quads, and reglets will be of common service to all founts. As alternatives to Caslon Old Face, good modern book faces are *Kennerley* or *Garamond*; while for the 18-pt. titling founts, excellent faces are *Goudy Hand-tooled* and the recent sans serif type designs by Eric Gill. Plate X shows some specimens of these type faces.

ORNAMENTAL BORDERS. Border types, of which specimens are shown in Plate X, are usually cast on a square body. They are used as borders or for occasional decorations on the printed page. Very often they may be arranged in many different combinations, but it is easy to overdo the use of ornament in typographical display, and some restraint is advised in their employment.

The fame of Aldus's printing office soon spread throughout Europe, and his pocket editions of the Greek and Latin classics were esteemed as much for the beauty of their dress as for the accuracy of their text.

12-point Caslon Old Face

The fame of Aldus's printing office soon spread throughout Europe, and his pocket editions of the Greek and Latin classics were esteemed as much for the beauty of their dress as for the accuracy of their text.

12-point Baskerville

The fame of Aldus's printing office soon spread throughout Europe, and his pocket editions of the Greek and Latin classics were esteemed as much for the beauty of their dress as for the accuracy of their text.

12-point Modern

This line is set in 12-pt. Cheltenham Old Style £124567890

This line is set in 12-pt. Cheltenham Bold £1234567890

A SPECIMEN LINE OF GILL SANS SERIF

A SPECIMEN OF GOUDY HAND-TOOLED

No. 150
12-point

No. 3
12-point

No. B272
12-point

No. 64
12-point

No. B52
12-point

No. 168
12-point

PLATE X. SPECIMENS OF TYPE FACES AND BORDERS

THE STORAGE OF TYPE. As soon as it is received, it will be necessary to *lay* the type in the cases. A type case is shown in Fig. 26. For book or Roman founts there is a special arrangement or "lay" of the cases, so that the most frequently used letters are nearest to hand when composing is being done. Generally, a fount of type is contained in two cases, the *upper case* and the *lower case*. It is from this arrangement that the term *lower case* (i.e. the minuscule

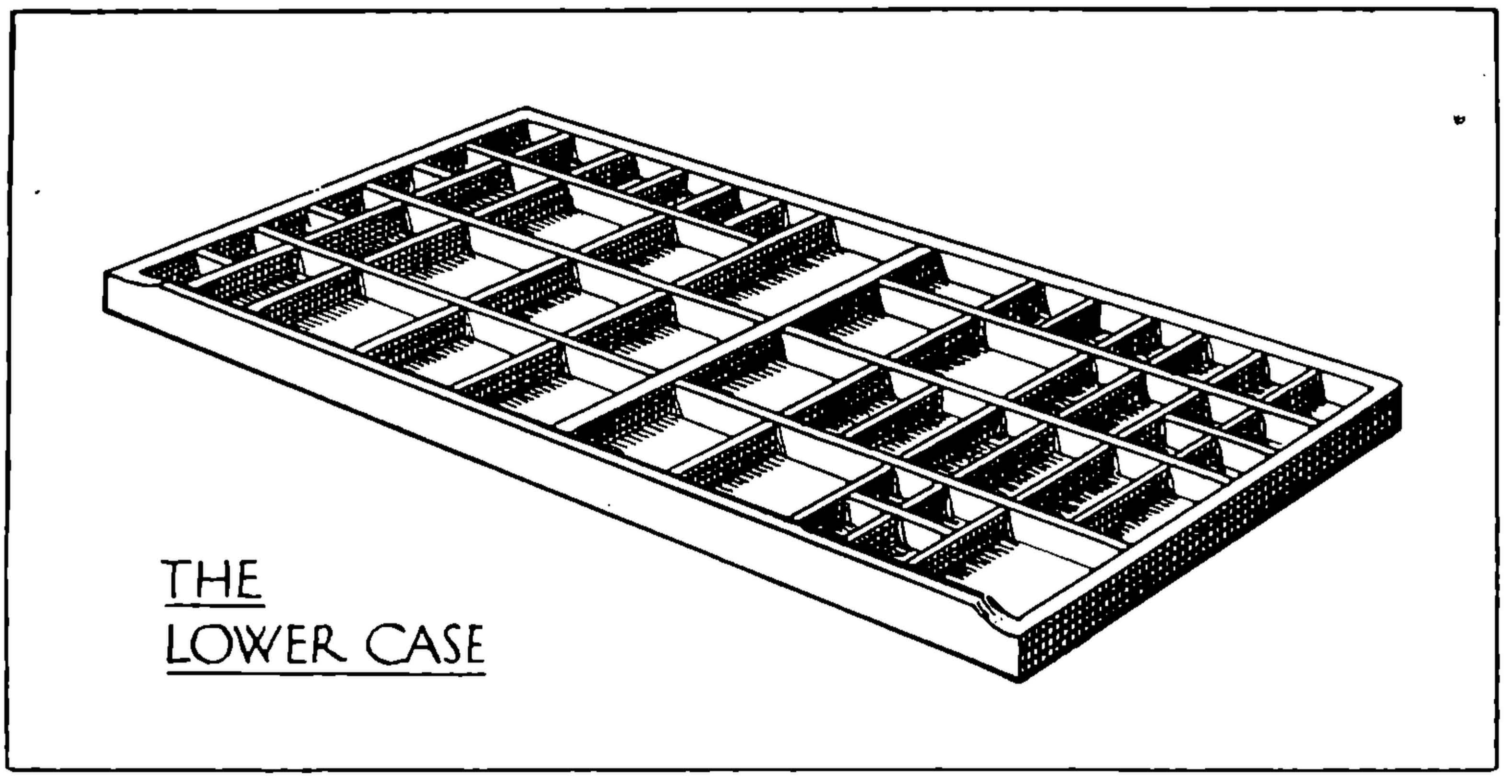


FIG. 26
A TYPE CASE

or small letter) has grown up in reference to lettering. There are various other kinds of cases; double—accommodating both capital and small letters in the one case—treble, four founts, and other special arrangements. The construction of these cases is dealt with in another chapter.

The usual arrangement of the lower case is shown in Fig. 27, together with a modified form of upper case suitable for school purposes. When the fount of type is received from the foundry, it should prove no very difficult matter to "take it down" and to put each character into the space provided for it. If the fount be sprinkled lightly with water, this will help the type to cling together and prevent it from falling into *pie*. In laying the type it must be remembered that the letters are, of course, reversed, so

that at first some confusion may arise between such letters as "b" and "d" or "p" and "q." If, however, it be remembered that the nick is at the bottom of the type,

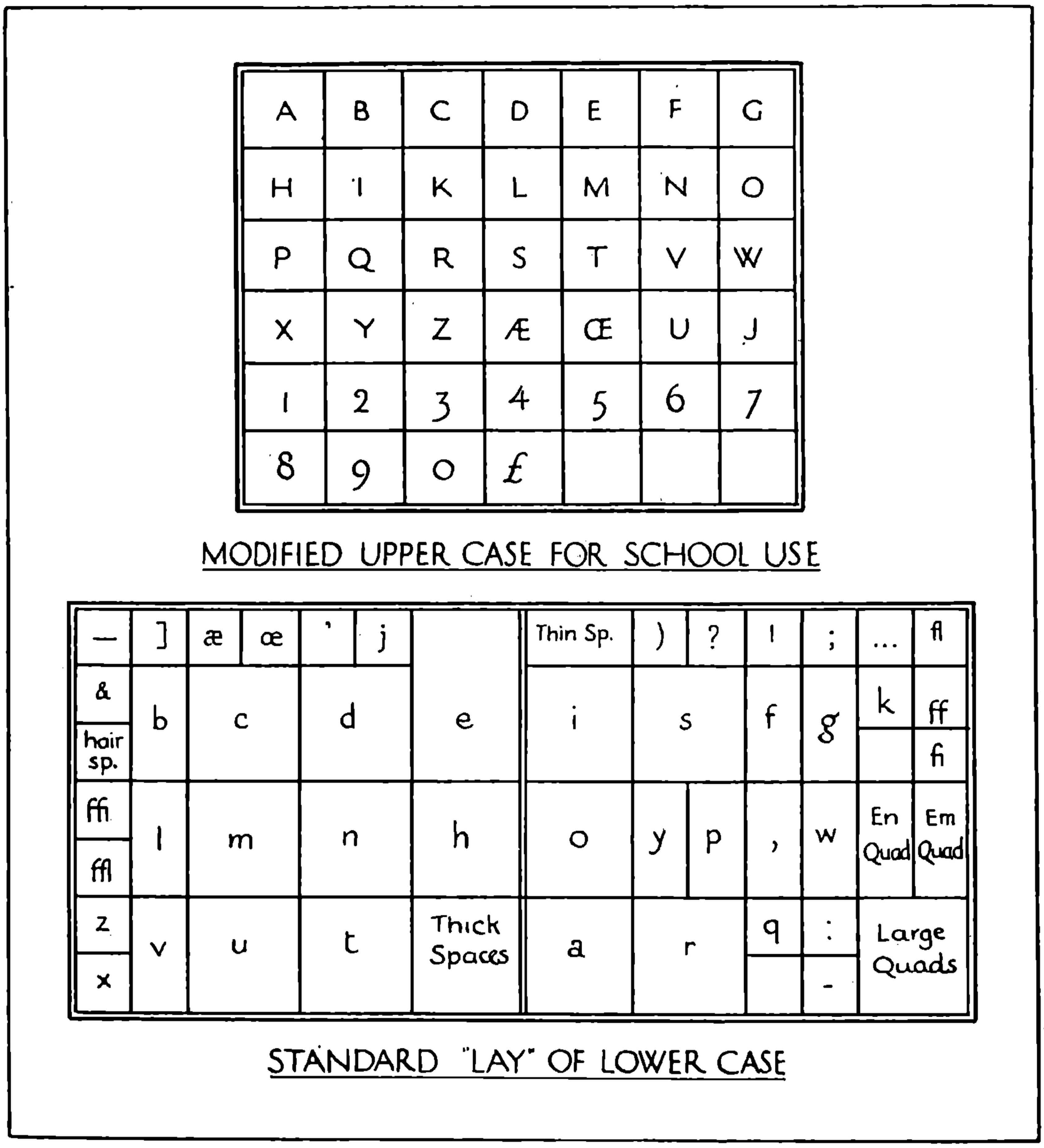


FIG. 27
ARRANGEMENT OF CASES

and if the characters be put in their correct places in the case at the outset, these initial difficulties will soon be overcome. Another source of confusion will be in the small capitals, where such letters as c, o, s, v, w, x, and z are very similar in appearance to the lower-case characters;

here the two can be distinguished by the fact that the small capitals have an extra nick in the back edge of the type as well as on the front edge. It is a good idea to draw out a fairly large, clear plan of the lay of the case, and to pin it up prominently in front of the pupils while they are working, in order to help them in memorizing the arrangement.

In concluding this chapter, it may be well to give a summary of the materials and appliances necessary (in addition to the press) to begin printing. Some of these may be made in the school, but many will have to be purchased. Firms from which such materials may be obtained are mentioned at the end of the book.

Extra Chase.
Furniture, Reglets, and Leads.
Sidesticks and Quoins.
Founts of Type.
Type Cases.
Galley.
Composing Stick.
Brass Rule.
Gauge Pins.
Mallet.
Planer.
Ink (best Black, in tube).
Bodkin.
Tweezers.
Palette Knife.
Shooting Stick.
Imposing Surface.

CHAPTER VII

SCHOOL PRESSES AND OTHER APPARATUS

UP to comparatively recent times the great obstacle to the adoption of printing as a school craft has been the difficulty of obtaining a suitable press. The smallest press available with which any reasonable amount of work could be done was generally far too expensive. Recently, however, conditions have greatly improved, and for those who wish to purchase a simple press for school use, there are lighter, cheaper machines now available. There are, in general, three courses open to those who wish to establish a school printing press: (1) to make a suitable press themselves—possibly with the help of the handicraft centre; (2) to purchase one of the cheaper variety of printing machines now available; or (3) to invest in a really good hand platen machine such as would be used for smaller "jobbing" work in the trade. The firm of Adana supplies both types of printing press, light and heavy. Much excellent work is possible with either of the first two kinds, the work being necessarily limited in size by the dimensions of the press; while, with the third type of machine, especially if the type area is of a fair size, say, 12 in. × 8 in., work of a much more advanced character, coupled with greater speed in printing, is possible.

PRESSES OF SCHOOL CONSTRUCTION

A SIMPLE PRESS FOR HAND INKING. The design of the small hand-press shown in Fig. 28 has been kept as simple as possible, but, if made with reasonable care and accuracy, it should be capable of producing quite good work within its limits. The inside sizes of the chase are 4 in. × 3 in., so that it will be possible to produce plenty of printed matter, such as tickets, labels, and small notices. If a

larger printing area be desired, it is possible, without modifying the design, to increase the sizes up to about

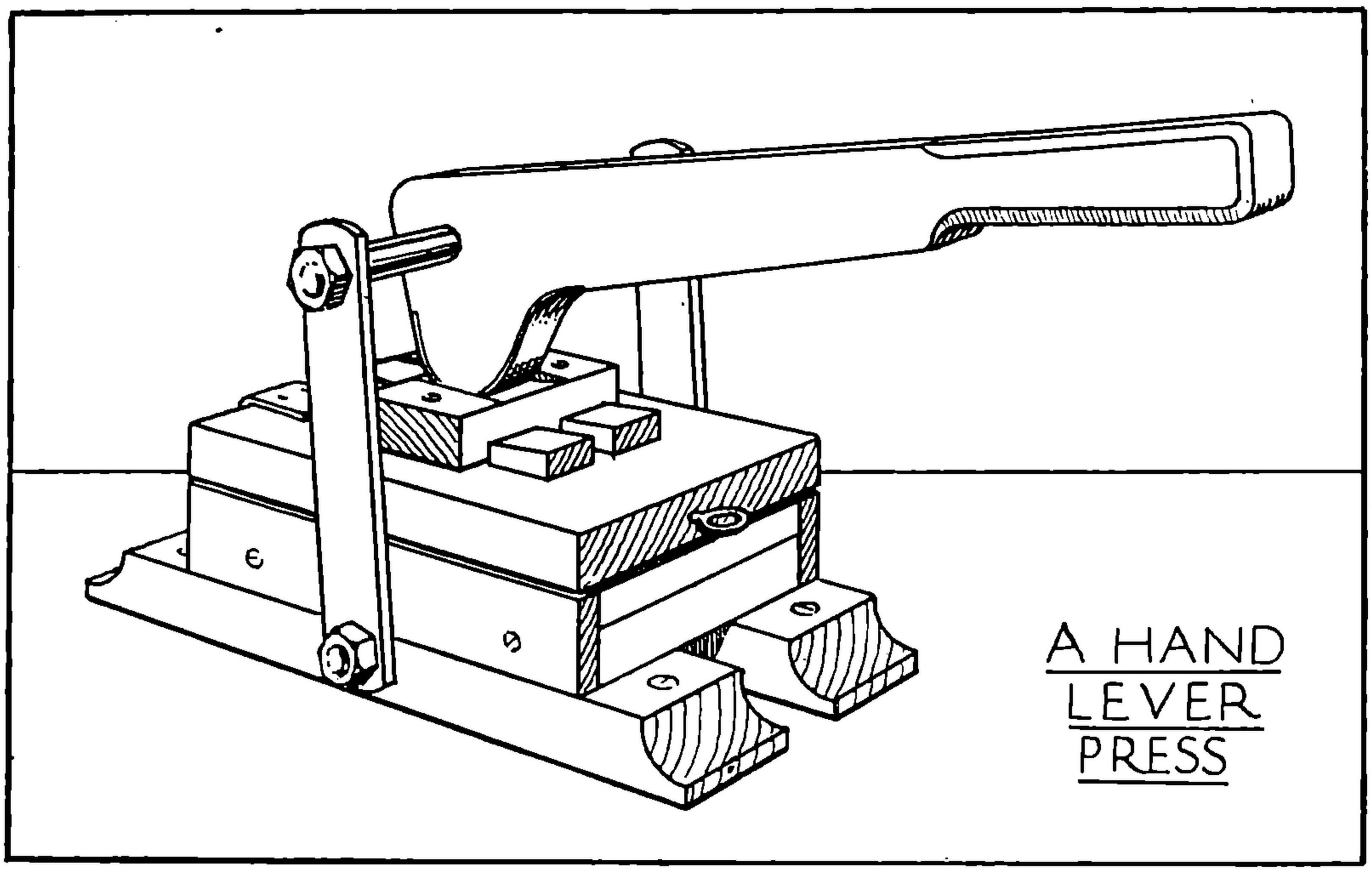
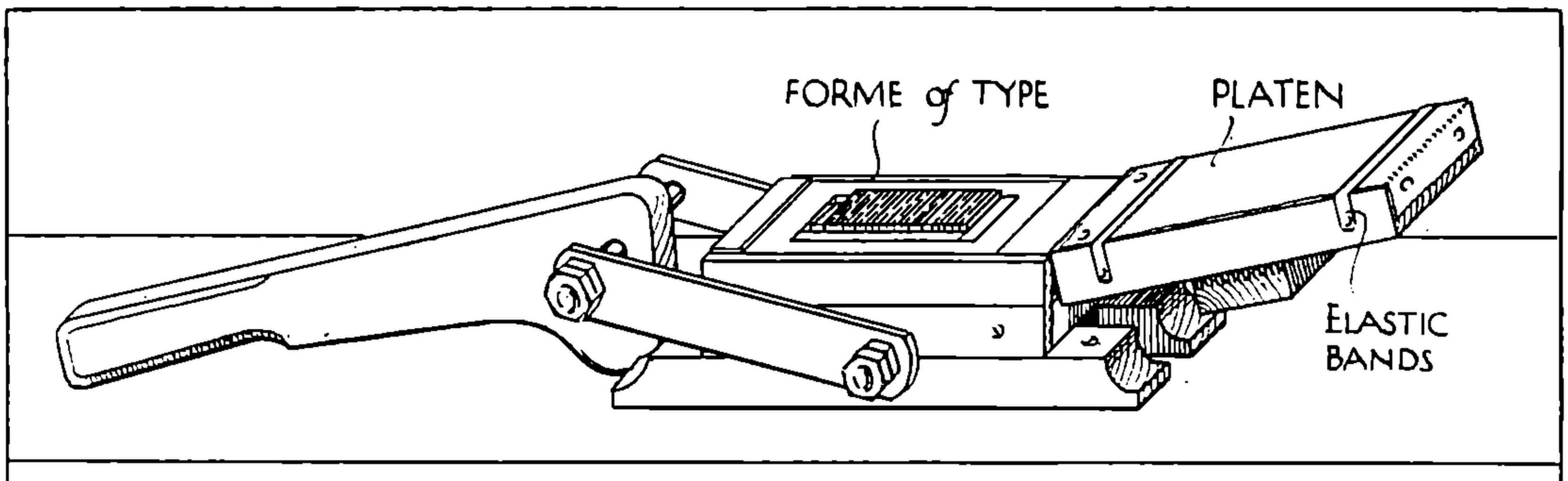


FIG. 28
A SIMPLE HAND-PRESS

7 in. × 5 in., as long as thicknesses are also proportionately increased.

A general idea of the principles upon which the press



PRESS OPEN READY FOR INKING TYPE

FIG. 29

works may be gathered from Figs. 28 and 29. The latter shows the press open, ready for inking the type, which is composed and *quoined up* in the chase, and secured in position upon the bed of the machine. The platen is folded

back, ready to receive the paper to be printed. When the type is inked—by means of a hand-roller—the platen is brought down upon it. The closed press is shown in Fig. 28.

Pressure is obtained by means of the lever and toggle shown. When the lever is depressed, the toggle action causes the platen and bed to be brought together, pressing the paper with great force upon the type, and thus printing the matter set up. The lever is then lifted clear again, the platen opened, and the paper extracted; the type is then re-inked, and the process repeated.

MAKING THE PRESS. Plate XI contains, to the scale shown, all the working drawings necessary for the construction of such a press. The wood chosen should be good, sound, well-seasoned hardwood, such as oak or beech. The ideal material, which it is sometimes possible to obtain, is a thick plywood, twelve-ply or fourteen-ply, which can be depended upon to keep flat. A beginning should be made by preparing the bed and the platen. The meeting surfaces of these two pieces of wood must be made perfectly flat, by accurately surfacing them with a finely-set plane, and finishing across the grain with glasspaper wrapped round a hardwood block. This is a most important stage of the work, and the two pieces should almost cling together if these surfaces be well prepared. Upon the bed *A* (see Plate XI) are screwed two pieces *B* ($\frac{3}{4}$ in. thick) between which the chase fits. Thinner pieces *C* are screwed to the sides of the bed. The two essential parts of the press, the platen and the bed, are now ready for hingeing together. To do this it is necessary to plane a third piece of wood very accurately to a thickness equal to the height of a piece of type (type-high). This should be of the same size as the outside of the chase, and is used as a guide in fixing the hinges. Place it on the bed of the press, add three or four sheets of paper, then the platen, and finally cramp together

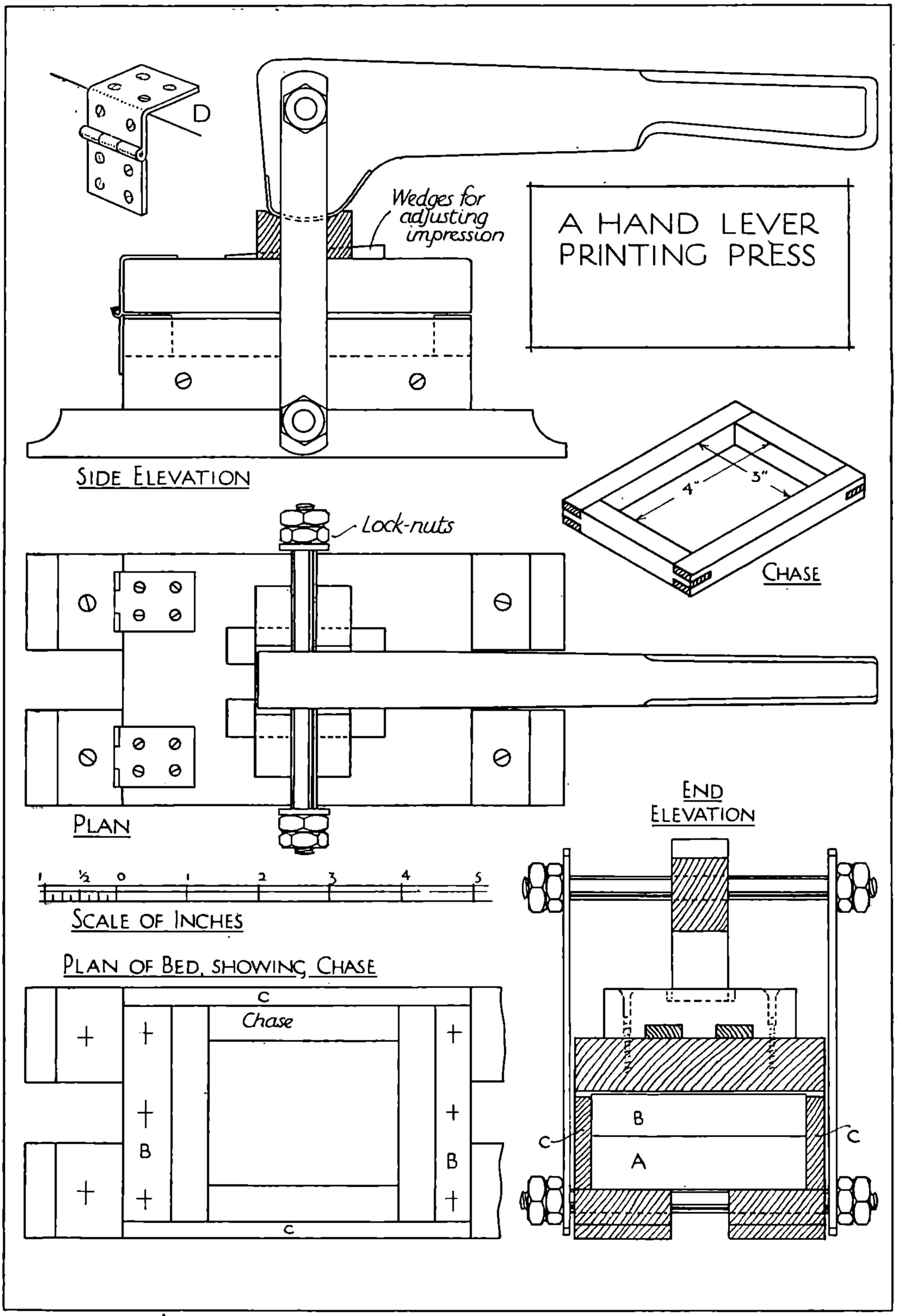


PLATE XI
WORKING DRAWINGS OF SMALL HAND-PRESS

the three pieces—bed, type-high block, and platen—with suitable G-cramps. The hinges *D* may now be screwed on. These are the ordinary type of flap hinge bent in the vice as indicated.

The pressure apparatus consists of two circular steel rods, $\frac{3}{8}$ in. diameter for the size of press illustrated, connected by flat side links as shown. If it is difficult to get

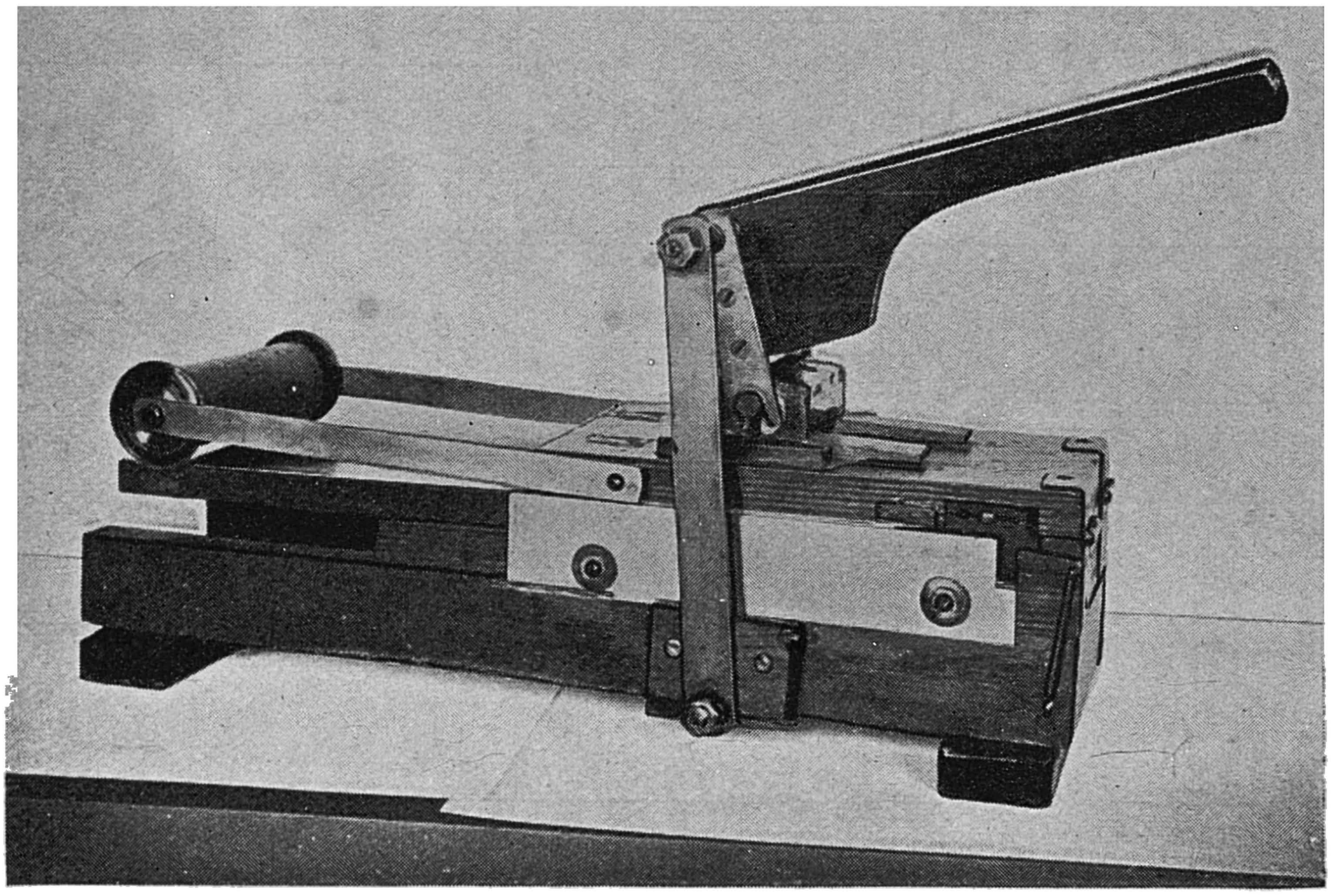


FIG. 30
PRESS WITH AUTOMATIC INKING
Press closed, with impression off

these rods specially made, and the screw threads cut on the end, ordinary 6-in. bolts and nuts may be used. The lower rod passes beneath the bed, being held in position by means of slots cut in the two strips of wood forming the base, while the upper carries the wooden lever. This lever should be carefully worked to the shape shown, and a brass strip should be fitted round the curved end which meets the platen.

The degree of impression (a necessary adjustment when printing paper or card of varying thicknesses) may be controlled by the wedges, which raise or lower the cross-piece

of wood, which takes the pressure from the lever. The general view (Fig. 28) should make this clear.

The chase may be a simple wooden frame, strongly jointed at the corners. Care should be taken that the inner edges are perfectly square with the bed, for if they are not,

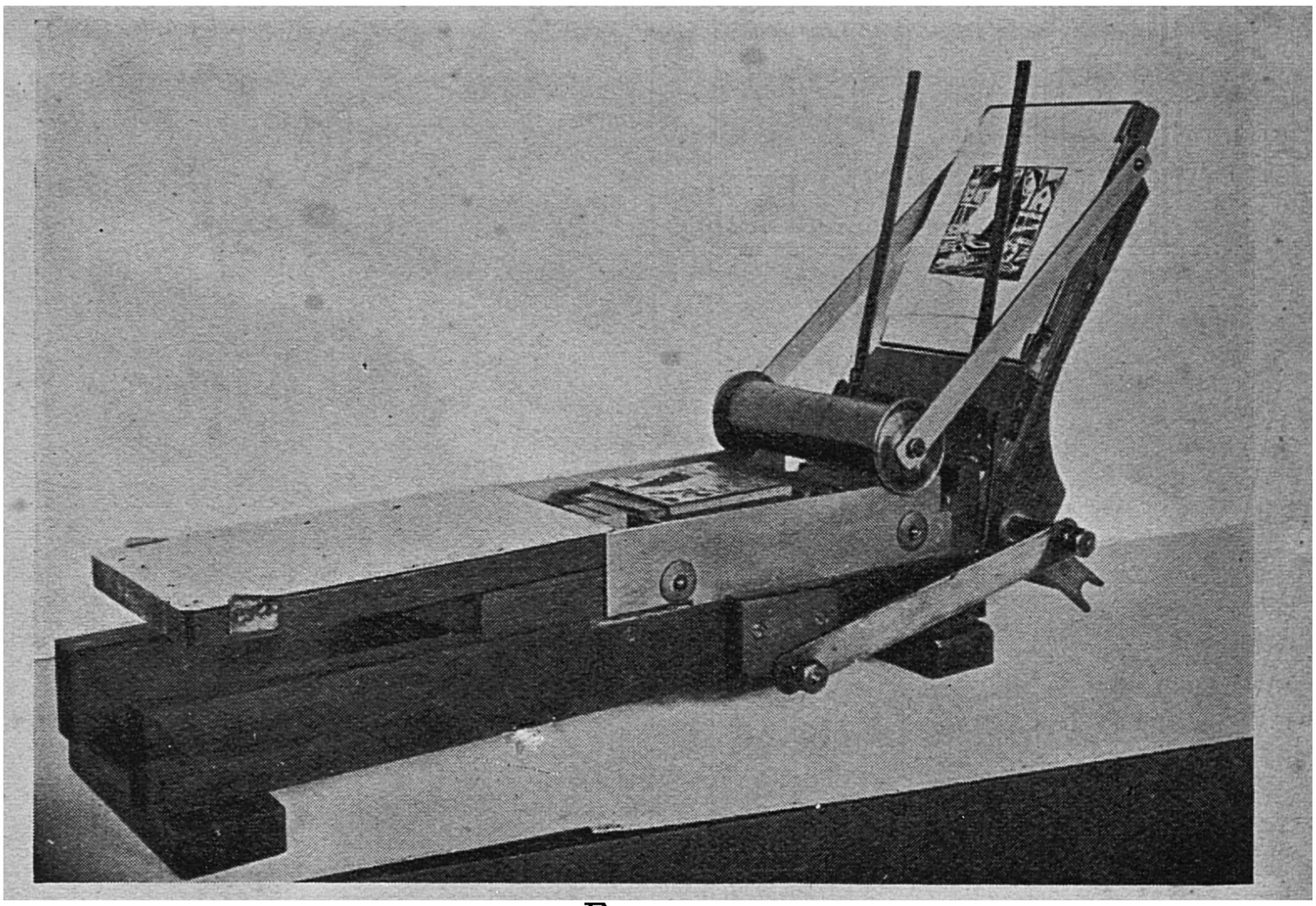


FIG. 31
PRESS WITH AUTOMATIC INKING
Press open

it will be impossible to produce a flat forme of type, and good printing will be impossible.

Minor fittings may now be added—such as elastic bands to hold the paper or card during printing, and a large screw-eye to serve as a handle for lifting the platen—and the press is complete.

A SCHOOL PRESS WITH AUTOMATIC INKING. The photographs (Figs. 30 and 31) show what has proved to be a very serviceable school press; and one which was made entirely, with the exception of the composition for the inking roller, within the school. The inking is automatic, and the pressure of the platen upon the type can be regulated

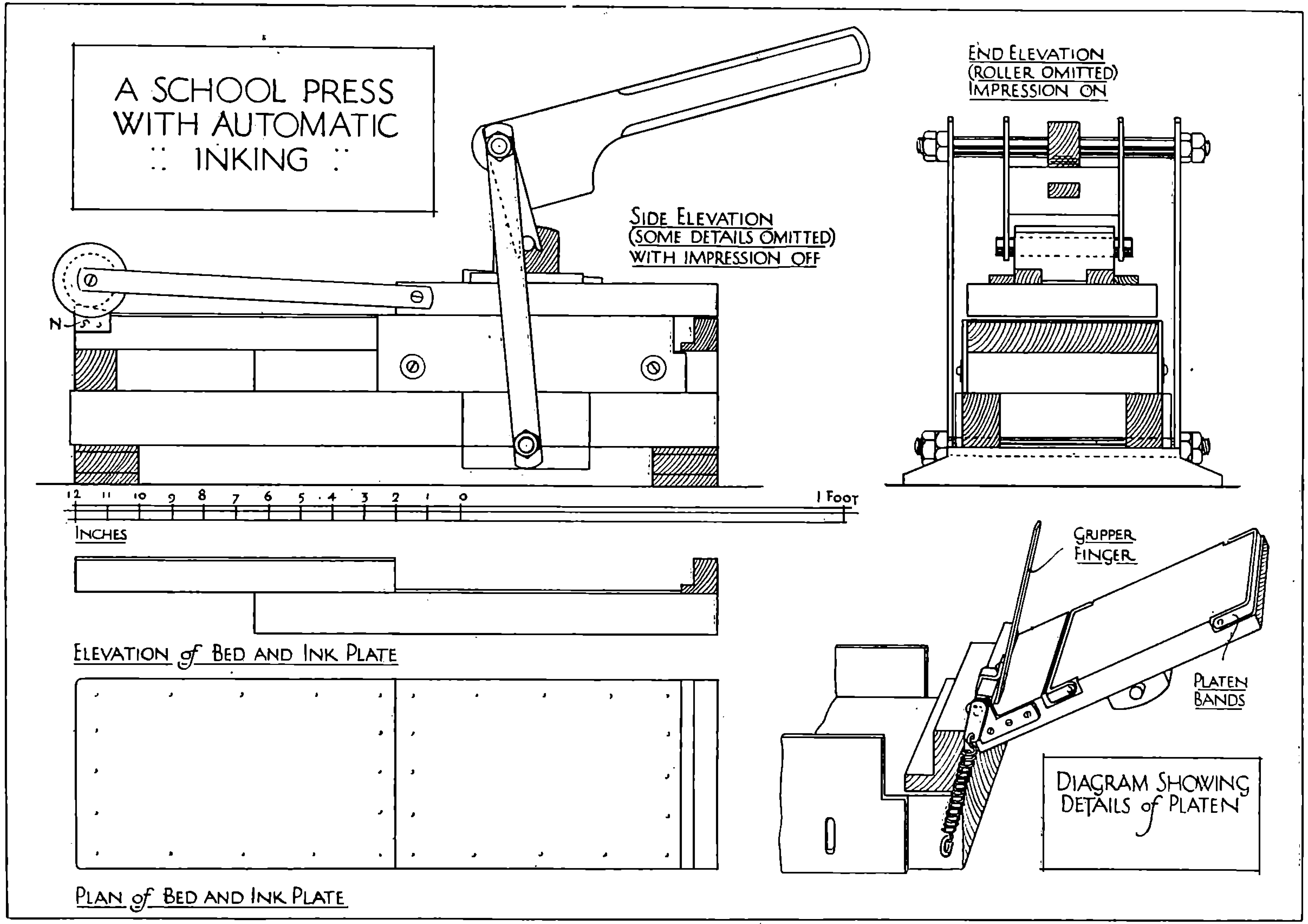


PLATE XII

WORKING DRAWINGS OF PRESS SHOWN IN FIGS. 30 AND 31

by means of wedges, and remains the same for each impression. The principle upon which it works is exactly the same as that of the press previously described. It has been elaborated, however, to include the automatic inking device and gripper fingers which lift the paper from the forme.

Since the method of construction is generally similar to that for the previous example, there is no need to describe it in detail; the photographs and the working drawings in Plate XII should be almost self-explanatory, though the

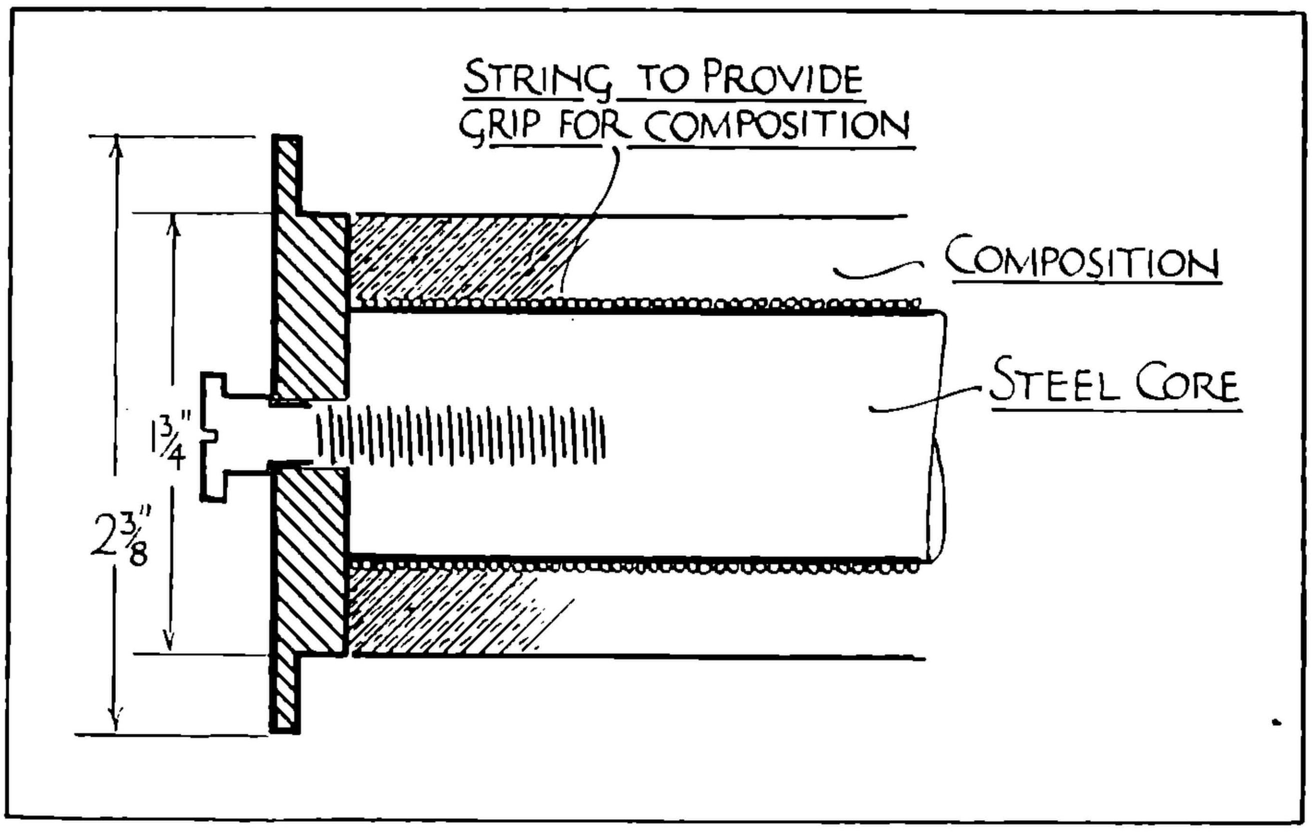


FIG. 32
DETAILS OF ROLLER CONSTRUCTION

inking device needs perhaps a little comment. An inking plate (a wooden slab covered with sheet metal) is added to the end of the bed, and the roller is connected by steel links to the end of the platen in such a manner that it passes from the inking plate over the forme and back—thus inking the type—at each impression. This roller should be fairly weighty, in order to press down upon the forme; the amount of roller pressure can be regulated by means of the adjustable roller bearers screwed to the sides of the bed. The core of the roller should be turned from a steel or iron bar (see Fig. 32), but if a lathe be not available, one method of making it is to weight a piece of iron tubing with lead,

inserting a thinner spindle before the molten lead is poured in. A piece of drawn brass tubing, with an inner diameter of from $1\frac{1}{2}$ in. to 2 in., must be purchased, to form a mould for the roller composition. The ends of this brass mould should be filled in with discs of three-ply wood with holes drilled centrally in them, in order to hold the metal core in position while pouring in the molten jelly. In the circumference of the top disc should be cut two V-shaped gaps, through which to pour. The roller composition, consisting mainly of gelatine and glycerine, had best be bought ready prepared, and melted in a glue-pot. Before casting, string should be wound round the core in order to provide a better grip for the jelly. The inside of the mould should be oiled, and then wiped as clean as possible before casting; after pouring in the molten composition, the roller should be left some hours to cool before withdrawing it from the mould.

The arrangement of the platen in this model is a little more complex. Platen bands are provided for securing the blanket and padding; while another feature is the gripper arrangement, regulated by a simple crank and spring. Another small but important fitting consists of the two pieces *N*, which lift the roller clear of the bed when the press is not in use, in order to avoid the flattening of the composition by lengthy contact with the bed. The construction of all these refinements should be clear from the illustrations, and should present no difficulty after a little experiment.

A SCHOOL-MADE PRESS WITH A LARGER PRINTING SURFACE. The presses described above have been proved by experience to be capable of producing much good work, which is, however, limited in size. Where anything in the nature of a booklet or pamphlet is required, it is desirable that the two opposite pages of a folder should be printed in one operation, so that the printing area should be something like 12 in. × 8 in. It is not practicable to construct

a press of this size along the lines of the two previous designs. Although the actual press is not now available for measurement and description, sketches and suggestions are appended (in Fig. 33) of a press, which was made originally for the purpose of printing a school journey guide book,

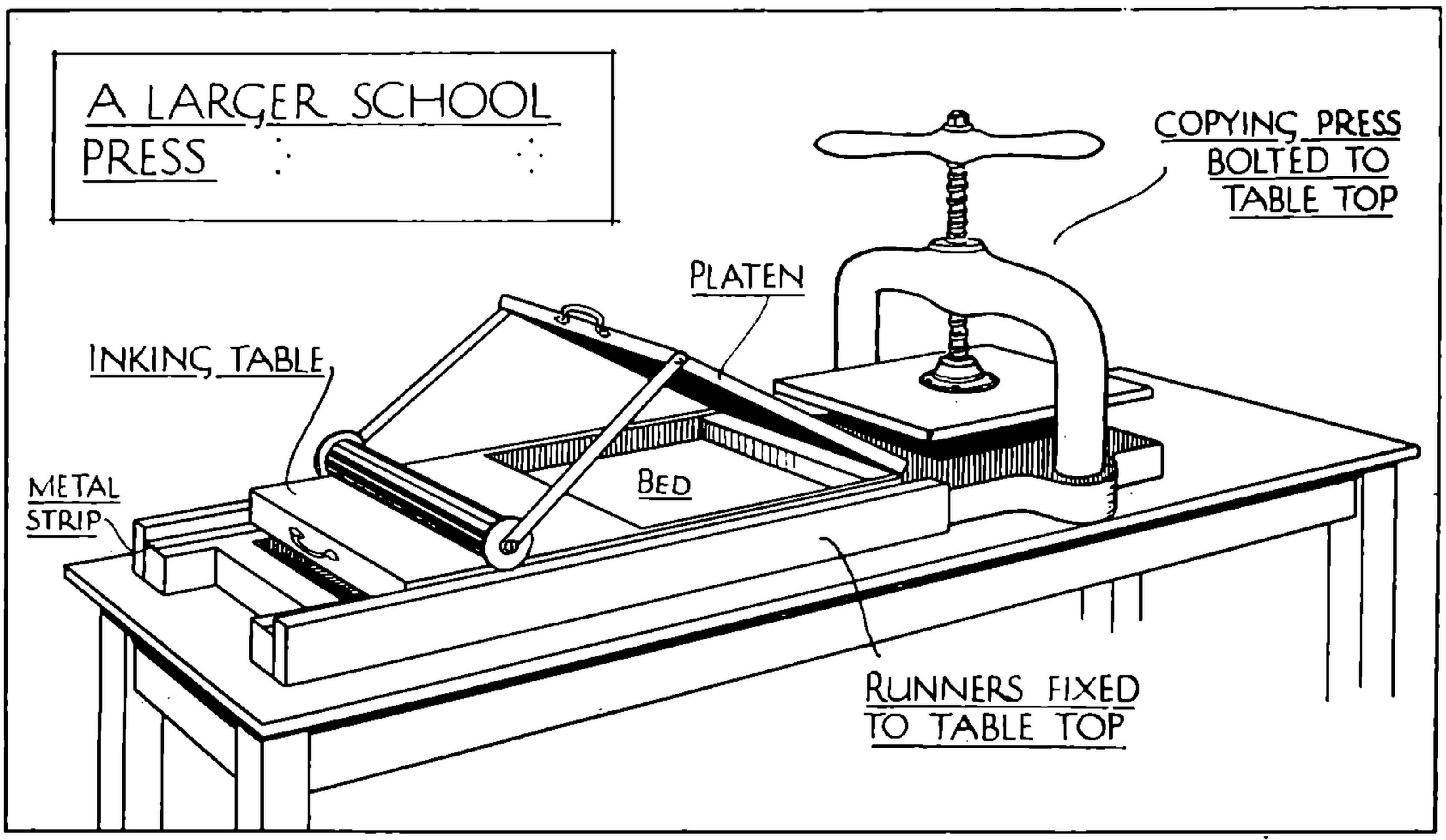


FIG. 33
SCHOOL PRESS MADE FROM COPYING PRESS

and one in which the pressure was applied by means of an old copying press, specimens of which can be picked up quite cheaply nowadays. This press is almost exactly similar in principle, except for the automatic inking, to the old hand-press, which remained in use in England in practically the same form from Caxton's time to the opening of the eighteenth century.

The bed, platen, inking plate, and roller are arranged in the same way as in the previous press. The only essential difference is in the method of applying pressure. Instead of using a lever and toggle action, which would hardly provide power enough for such a large forme, the whole of the bed and platen is slid beneath the screw of a copying press, pressure is applied by turning the screw, which impresses the type upon the paper; the pressure is then

released, the bed and platen withdrawn, and the paper taken out, when all is ready for the next impression. Although one with a fairly slow action, yet with a team of pupils working it, it is quite a serviceable press, and certainly solves the problem of obtaining sufficient pressure to print a large, full forme of type.

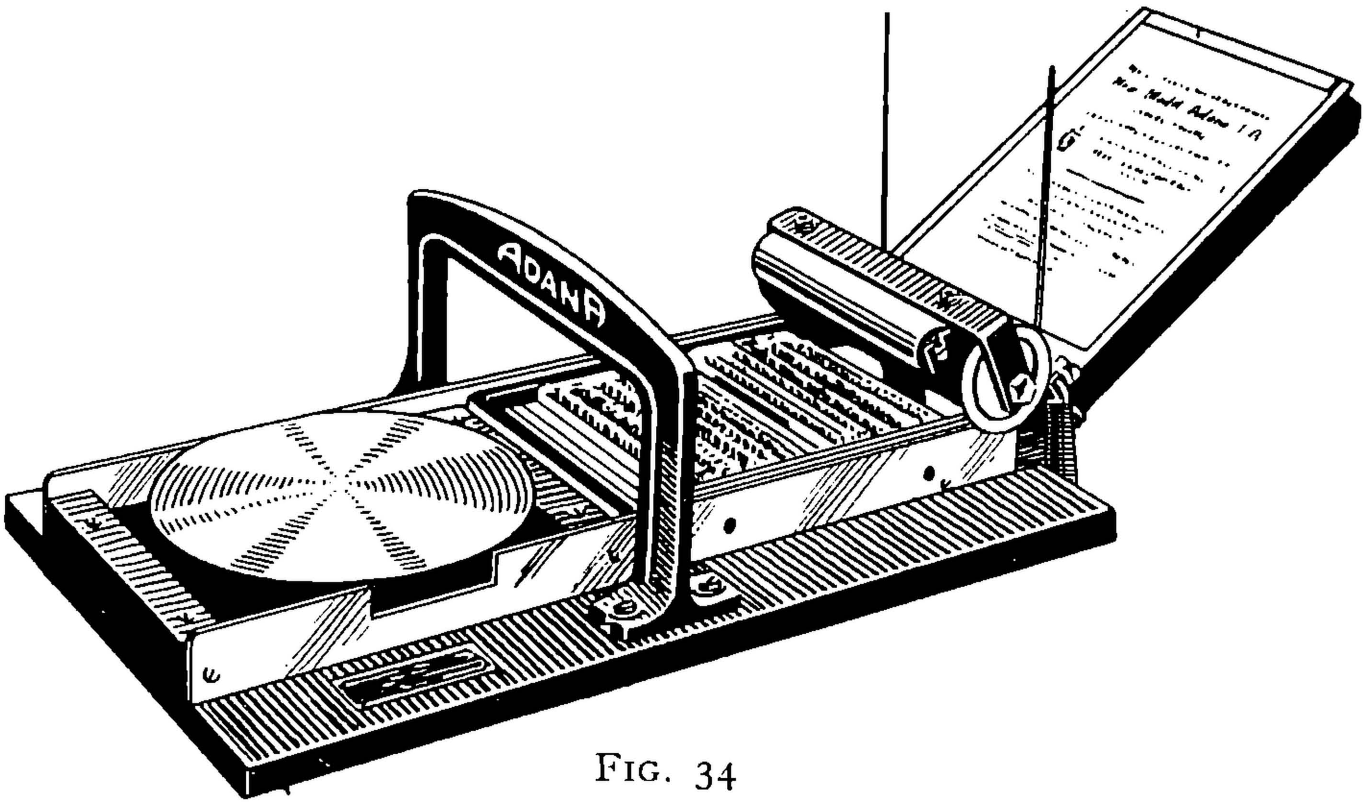


FIG. 34

THE ADANA PRESSES. Presses of the type manufactured and sold by Messrs. Adana, have come into extensive use among amateur printers during recent years. Being considerably cheaper, they are necessarily of lighter construction than the usual trade machine, but, nevertheless, it is possible, with the help of presses of this type, to turn out a good deal of first-class work. The latest and best made hand-press is that shown in Fig. 34, the Adana Model 1A. It is fitted with a revolving inkplate, a rider roller to control the supply of ink, and is capable of producing very good work at a high speed. In addition to having all the improvements of a modern hand-press the lever is attached to a bracket that extends right across the platen, therefore the disadvantage in the old type press of the pressure not being in the centre is greatly minimized. In fairly small work, this is not so great a disadvantage as it would seem to be, and to compensate for this, impressions can be

taken with this type of press at quite a good speed. In later, all-metal Adana presses, a central pressure is obtained.

HAND-PLATEN MACHINES. The ideal press, if printing is to be undertaken seriously as a part of the school craft

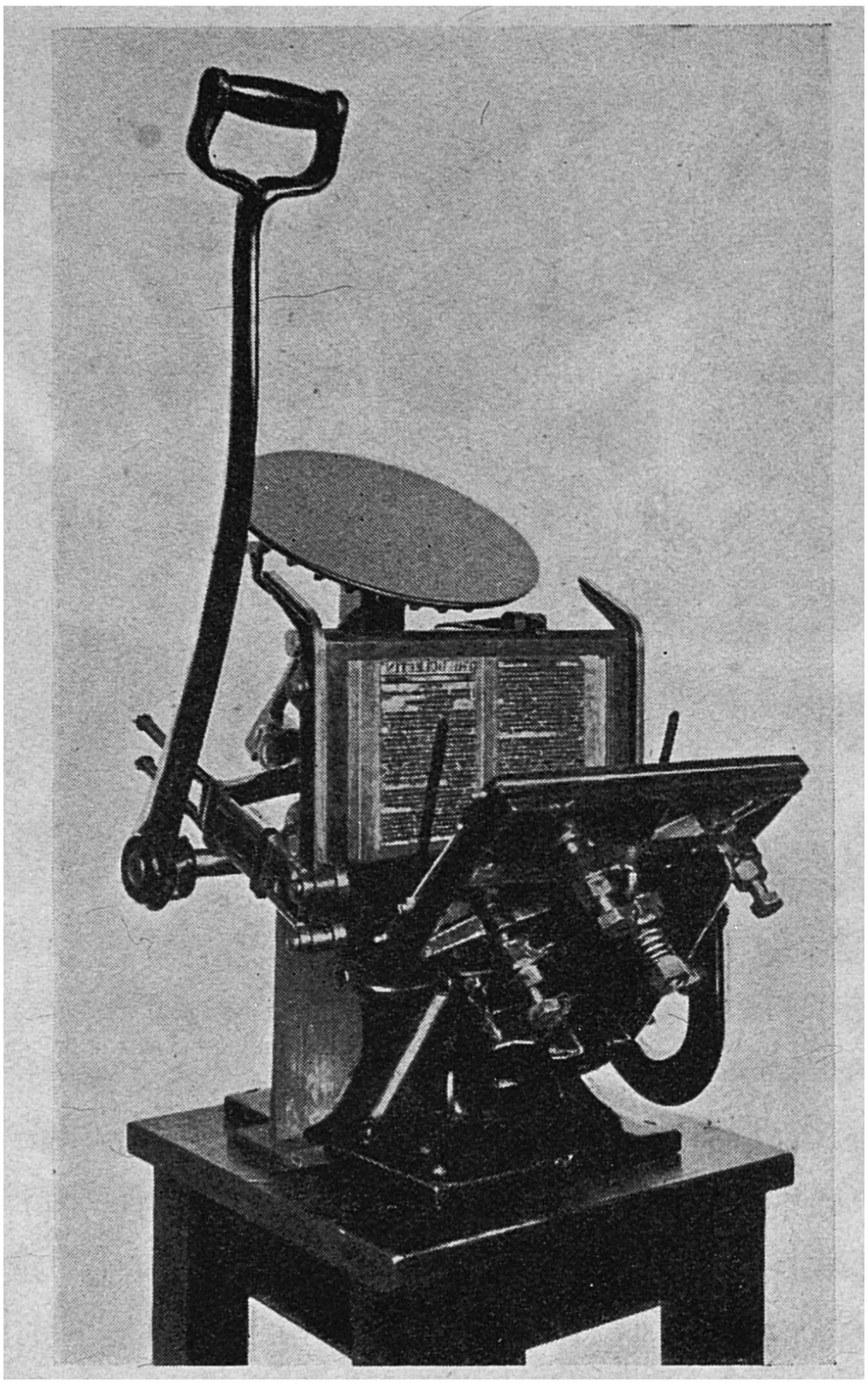


FIG. 35
A HAND-PLATEN PRESS
Two pages of the school magazine are seen, ready for printing

instruction, is what is known as a hand-platen press, of the type illustrated in Figs. 35 and 36. Being of much heavier construction than those previously described, a greater and a more even, *dead,* impression is possible, which is one of the essentials of good presswork.

These hand-platen presses are operated either by means

of a side lever or a front lever, the depression of which brings the platen with great force against the forme of type, which is in practically a vertical position. At the same time the inking rollers are taken over a circular inking

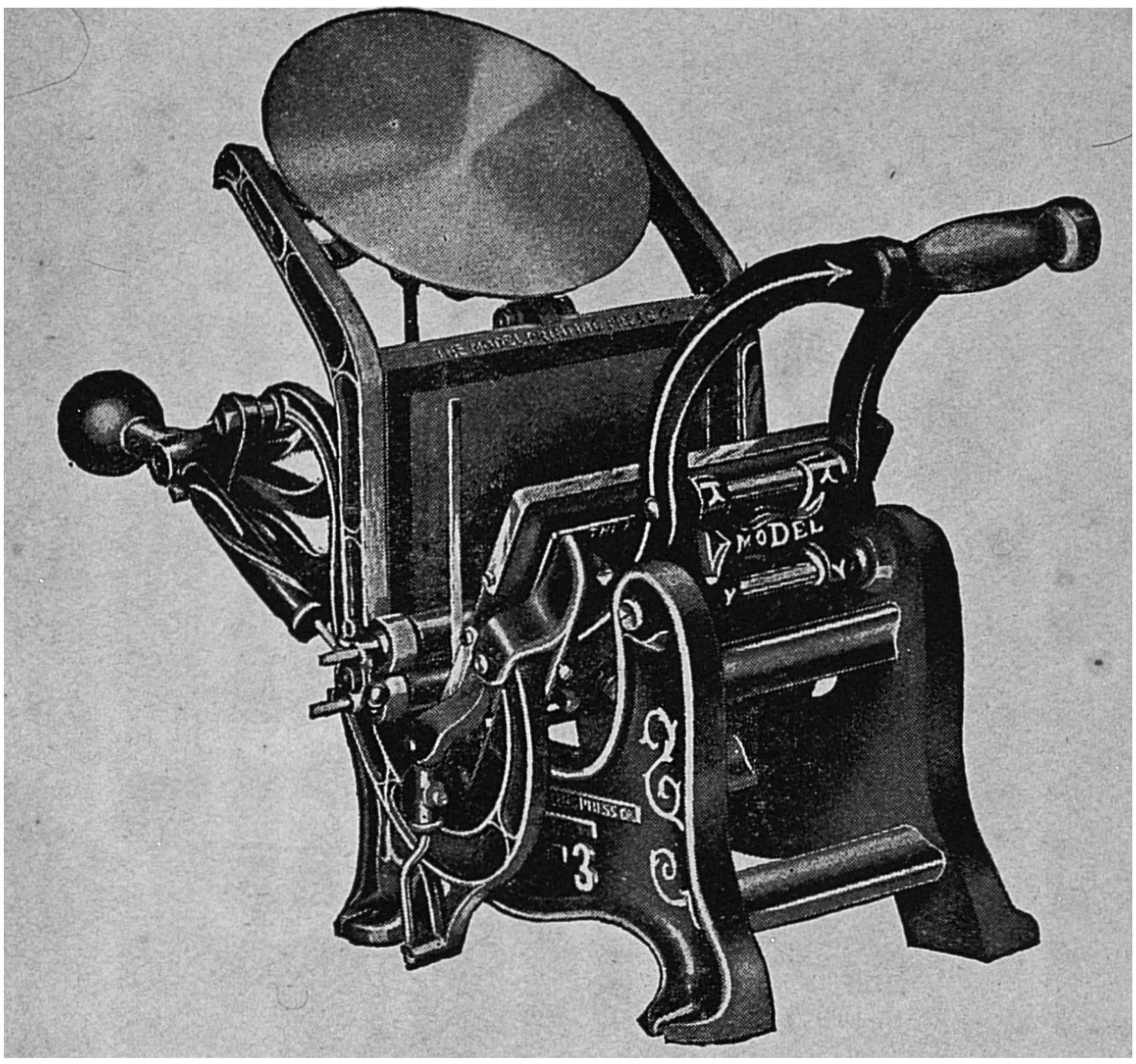


FIG. 36
ANOTHER TYPE OF HAND-PLATEN PRESS

table, which partially revolves at each impression, ensuring an even distribution of the ink. Efficient gripper fingers are provided which secure the work while it is being printed. If it is at all possible to acquire a machine of this type with a fairly large type area, there is little in the way of ordinary printing which may not be achieved.

Whatever type of press is decided upon, before it can be used to the best advantage it must be firmly mounted upon a table or stand. The smaller types of presses may be screwed to a firm table, but the larger hand-platen presses should have a strong bench made specially, of the kind shown in Fig. 37, to which the press should be secured with bolts or screws. Care must be taken that this stand is of

the correct height, so that the average boy may work at it without the discomfort of continual stooping.

SCHOOL-MADE TOOLS AND APPARATUS. If the school possesses the facilities necessary for handicraft in wood or

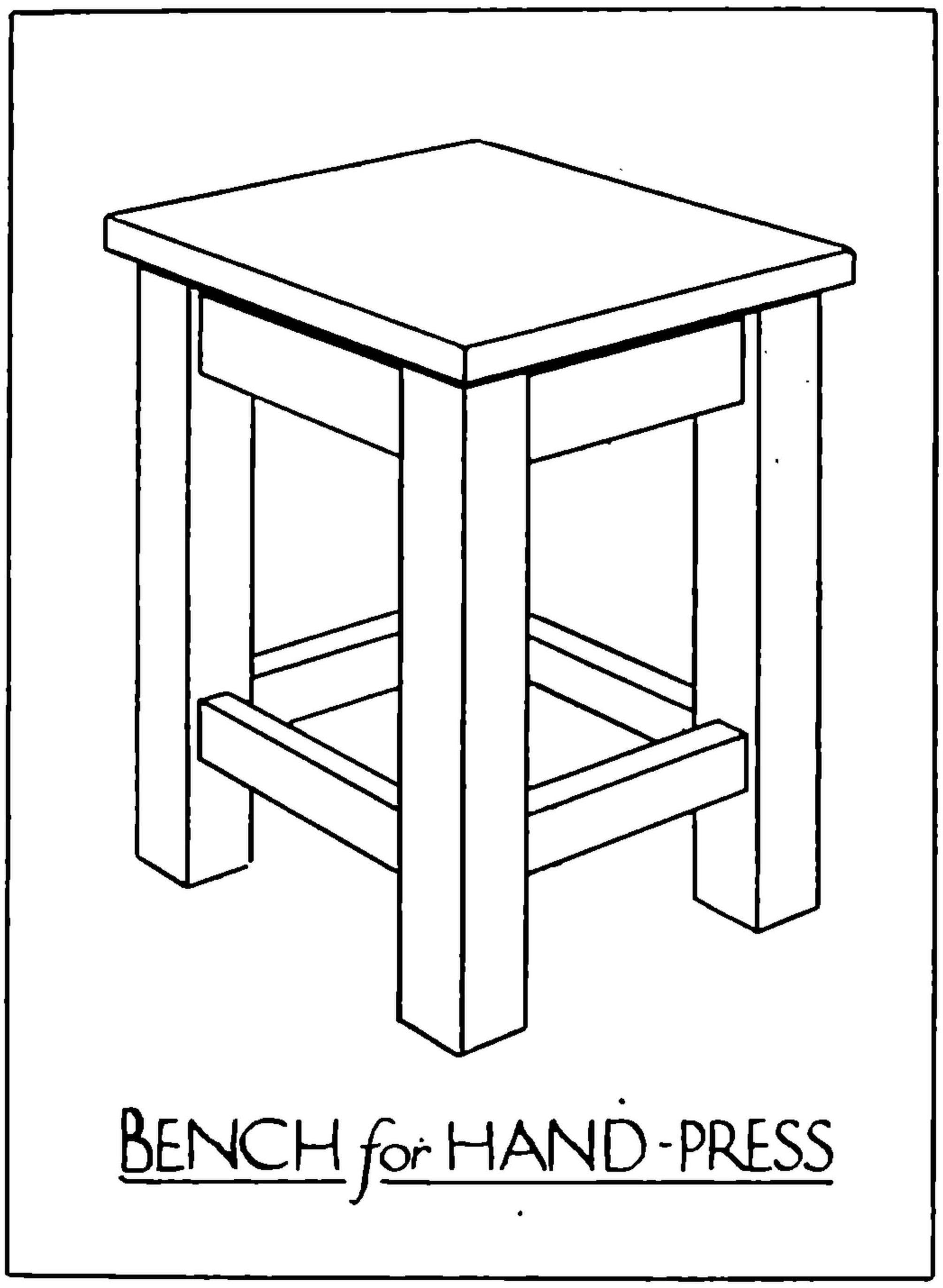


FIG. 37

metal, many of the appliances required for the various processes in printing may be made by the pupils. Where the co-operation of the handicraft teacher can be obtained, much valuable work may be done; there is always a special interest for pupils in making something which subsequently will be of some definite use. The photograph (Fig. 38) shows a group of these appliances which were made in the handicraft room of a central school, and which, besides being of value as exercises in handicraft, appreciably diminished the expense involved in the practice of printing.

Among the articles shown are: a case for type (one of many, of varying kinds, which were made), a wooden composing stick, a galley, shooting-stick, chases—of wood and metal—a guillotine cutter for cutting leads, and a "baby" press.

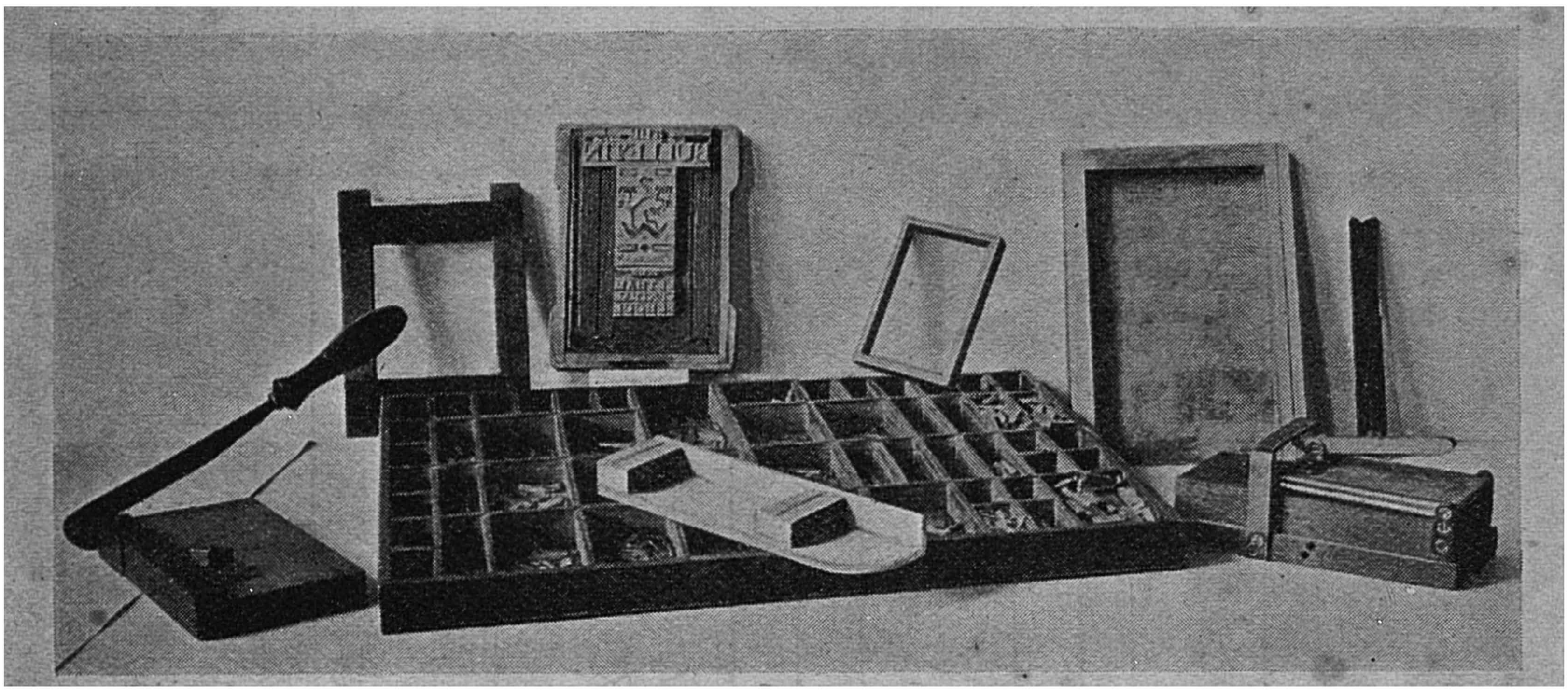


FIG. 38
PRINTING APPLIANCES MADE IN SCHOOL

CONSTRUCTIONAL SUGGESTIONS

TYPE CASES. There is little in the making of type cases which should need special comment—they should be within the powers of older boys who have had two or three years' instruction in woodwork. A great deal of labour and time may be saved if the material is obtained ready prepared, i.e. planed to a suitable width and thickness. Quite good cases for school use have been made from the better quality deal strips sold as garden or blind laths. The strips, whenever possible, should be carefully halved together and strengthened with glue (the liquid form in tubes is the most convenient), and with veneer or panel pins. The best way of cutting these halving joints is to cut those in the whole of the longitudinal strips in one operation, by fastening them together temporarily with brads, and then cutting the notches in the cross strips in a similar fashion. Fig. 39 should make this clear. When these strips are assembled into the framework of the case, carefully plane the lower

edges of the strips, so that when the bottom of the case is nailed on, no gaps will occur through which type can get into the wrong compartment. Three-ply wood is very good for the base (and for the strips also, if sawn and planed to a correct width), but the outside strips should be of a somewhat thicker material. In making type cases there are two or three general points which are worth remembering. First, plan the cases so that they are all a standard size—it

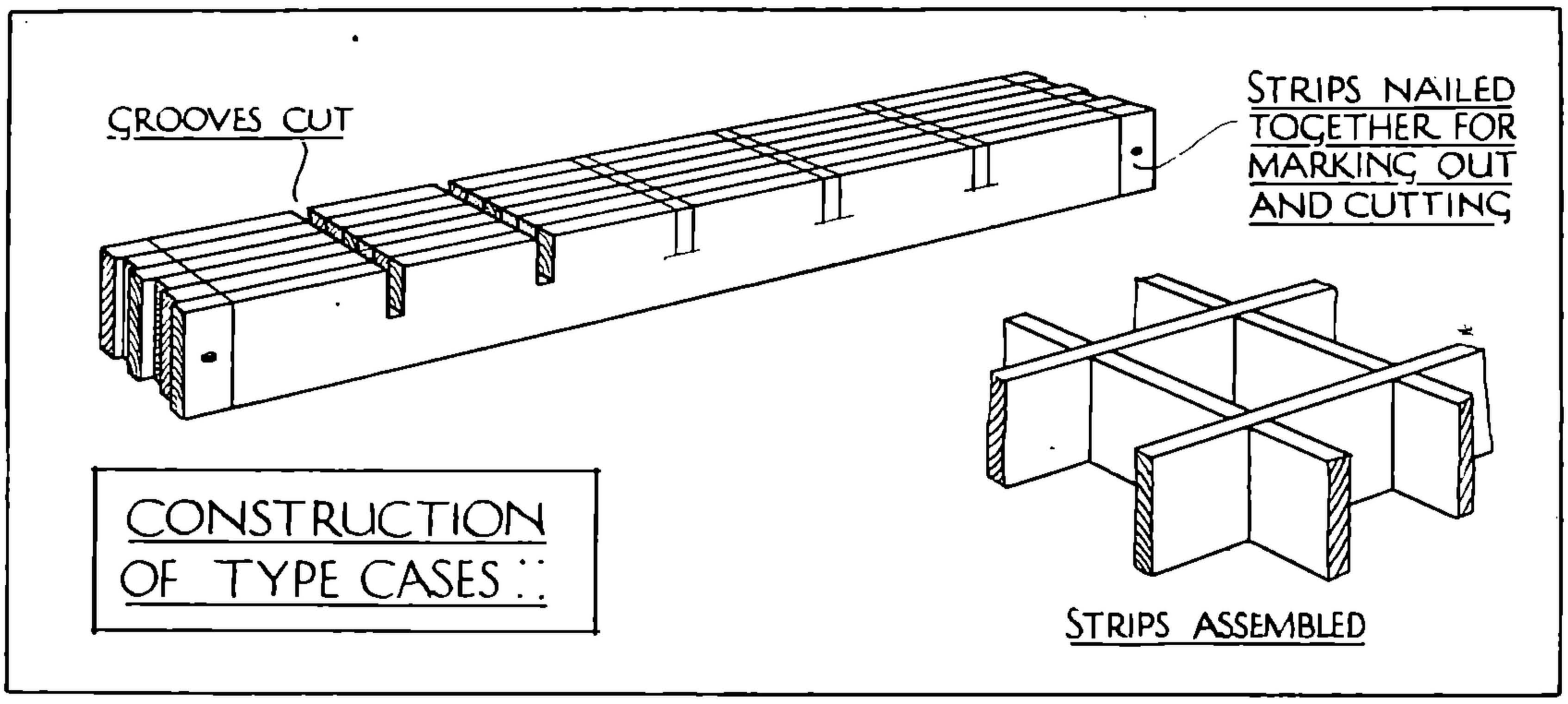


FIG. 39
DETAILS OF TYPE-CASE CONSTRUCTION

may subsequently be found possible to make a convenient rack to carry them, after the manner of the type cabinets used by professional printers. Secondly, do not make the individual compartments too small to allow of the easy insertion of the thumb and forefinger to pick up type. Thirdly, round off the upper edges of the dividing strips by rubbing with fine glasspaper; sharp, rough edges are apt to be very unpleasant for the compositor.

WOODEN COMPOSING STICKS. The composing stick should be a tool of extreme precision, and although quite simple in construction, calls for a degree of accuracy in assembling which is not usually possessed by pupils. Since so much depends upon a good composing stick, this had better be made by the teacher. Fig. 40 gives details of its

construction; for the blocks *A* and *B* short pieces of 72-pt. furniture are used, since these are machine planed and perfectly square. Strips of three-ply are used for the base and back. In assembling these parts a strip of wood should be prepared, quite square and cut exactly to the measure required in the stick. For school purposes, one of 24 picas (4 in.) is very suitable. This strip should be used as a guide in fastening—with liquid glue and pins—the blocks to the

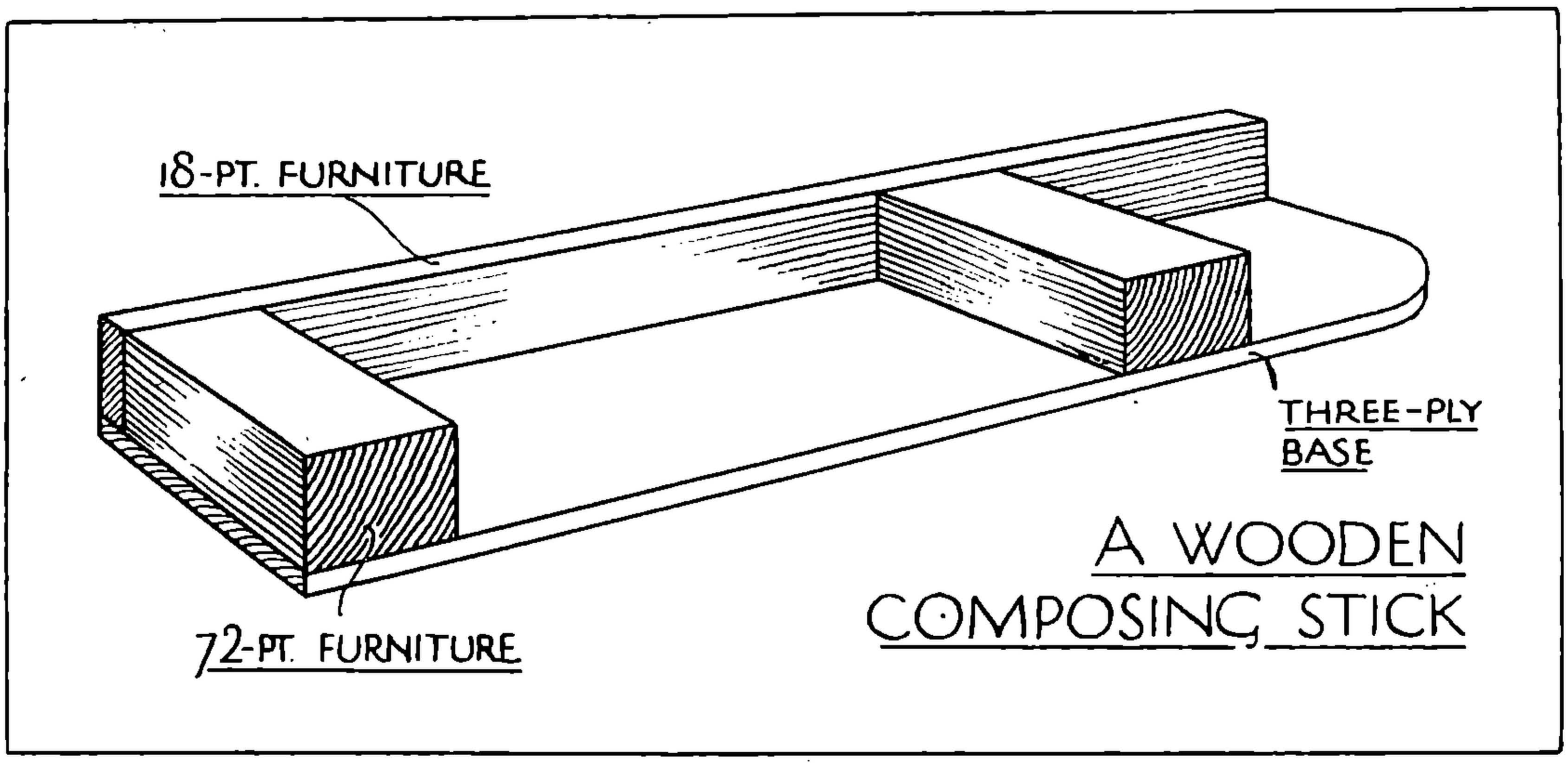


FIG. 40

strips forming the base and back edge. If a number of pupils are likely to work on the same piece of composing with different "sticks," it is of the first importance to make sure that they are all of exactly the same measure. The inner edges of wooden sticks are likely to wear quickly, especially with children's attempts at justification, so that as soon as wear is likely to produce inaccuracy, the stick should be discarded and another made.

GALLEYS. The construction of these is so simple as to need little comment. Here, again, furniture or reglet is useful for the edge strips (36-pt is a useful size). The corners should be jointed, as indicated at *A* (Plate XIII), and the bottom—a piece of sheet zinc—screwed on from beneath.

SHOOTING STICK. This is quite a simple metalwork

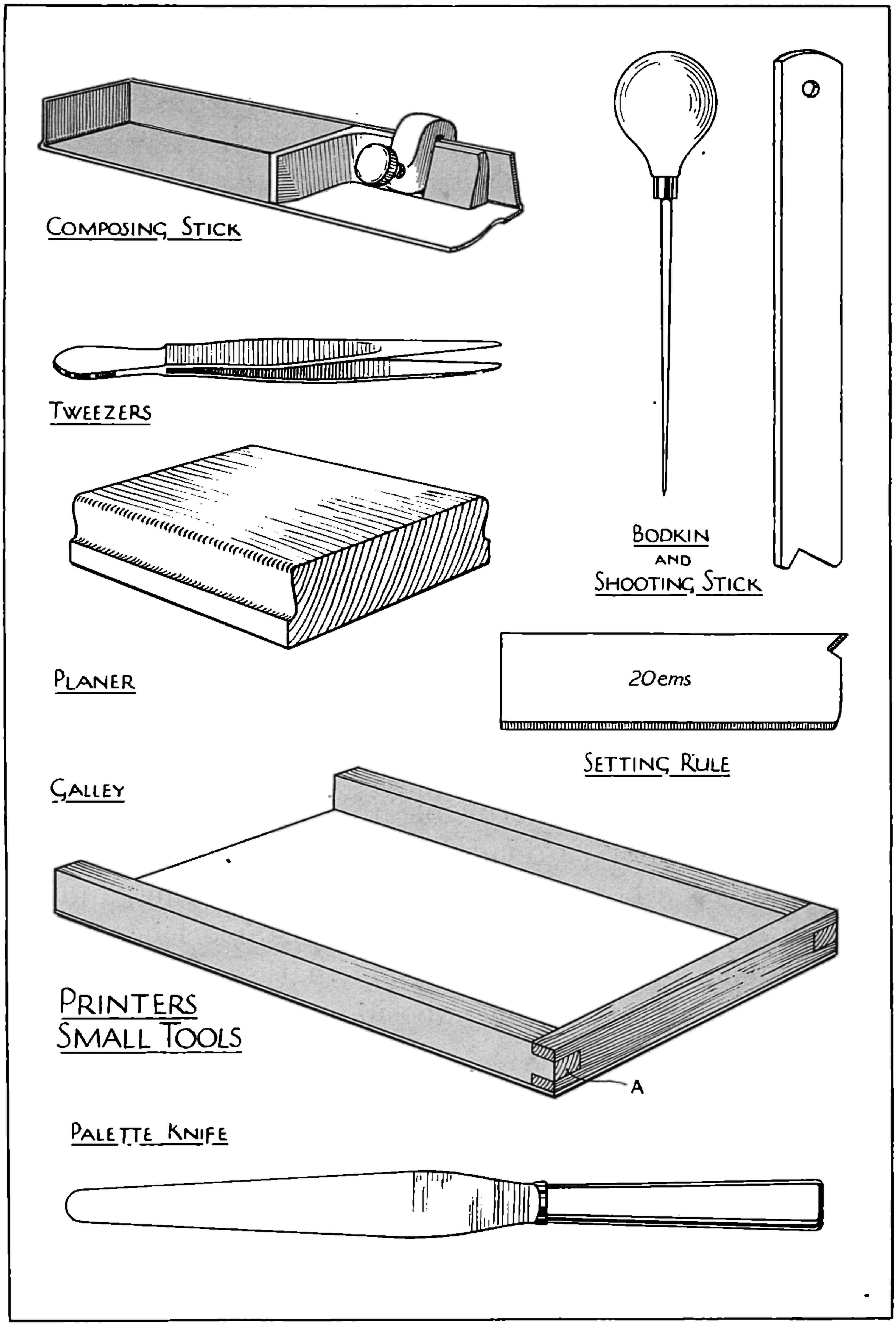

COMPOSING STICK
TWEEZERS
PLANER
BODKIN
AND
SHOOTING STICK
20 ems
SETTING RULE
GALLEY
PRINTERS
SMALL TOOLS
A
PALETTE KNIFE

PLATE XIII

exercise, being filed from metal strip about $\frac{3}{4}$ in. × $\frac{1}{8}$ in. (See Plate XIII.)

CHASES. Wooden chases are quite usable for small presses. They should, however, be made of accurately-planed hardwood, so that the inner edges are quite square. (See Plate XI.)

Metal chases are not so easily made, but are stronger and more generally serviceable. The most suitable method of construction in a metalwork centre has been to prepare the sides from metal strips of a sufficient thickness, to joint the corners in the way known in woodwork as a "bridle" joint, and then to secure them by brazing. This needs special facilities, but results in a serviceable article. The ordinary chase may be converted into a "screw-chase" by drilling and tapping holes in two edges and inserting grub screws.

A simple form of tweezers may be made by shaping and bending brass strip, while the making of a bodkin should present little difficulty.

A LEAD-CUTTER. The photograph (Fig. 38) includes a lead-cutter, similar in principle to the guillotine type of mount-trimmer or card-cutter used by photographers. It was made by a boy, keenly interested in printing, and has proved of very great service. An adjustable fence is provided so as to cut leads of varying lengths. Such a tool as this is invaluable, since in composing so much depends upon accurately-cut leads.

CHAPTER VIII

PROCESSES IN LETTERPRESS PRINTING

In the production of a piece of printed matter, the first process, is, of course, the selection of the necessary pieces of type and their arrangement into words, lines, and masses. This process is known as *composing* or *type-setting*. For the purposes of description, it is assumed that it is required to set up an ordinary paragraph of straightforward reading matter. We shall need for this purpose a composing stick. The usual metal form of this stick is shown in Plate XIII. It is a tool accurately made in metal, with a sliding fence to make it adjustable to various lengths, and it is indispensable for the setting-up of type. Being accurately machined, it is a fairly expensive item of equipment—a 6-in. stick costs about 7s. 6d.—it is, however, possible to use a home-made substitute such as the one described in the previous chapter. If the stick be of the adjustable type, we must set it to the length required for the longest line. This length is measured in ems, so that we must take the necessary number of 12-pt. lower-case "m's"—e.g. 18 ems, if the line is to be 3 in. long—and place them sideways in the stick. Then move the sliding fence along until they are snugly, but not too tightly, fitted; screw up the sliding fence; take out the "m's"; and all is ready to proceed with the composing.

The method of holding the stick while composing is shown in Fig. 41. It is held in the left hand, with the thumb inside resting lightly against the last type inserted, in order to keep the types upright while setting. The setting rule (Plate XIII) is next placed in the stick. In addition to the setting rule, insert a lead of the correct length. To begin composing, pick up each piece of type between the

forefinger and thumb of the right hand and place it in the left-hand side of the stick (Fig. 41) with the nick uppermost, the thumb of the left hand keeping it in position. The words will follow on from left to right, but upside-down; and the compositor should accustom himself to reading the matter in this position, in order to detect and correct errors as they occur. Remember that the nicks of the type should show clearly, and that they indicate the bottom of the letter; and, since these nicks vary with differ-

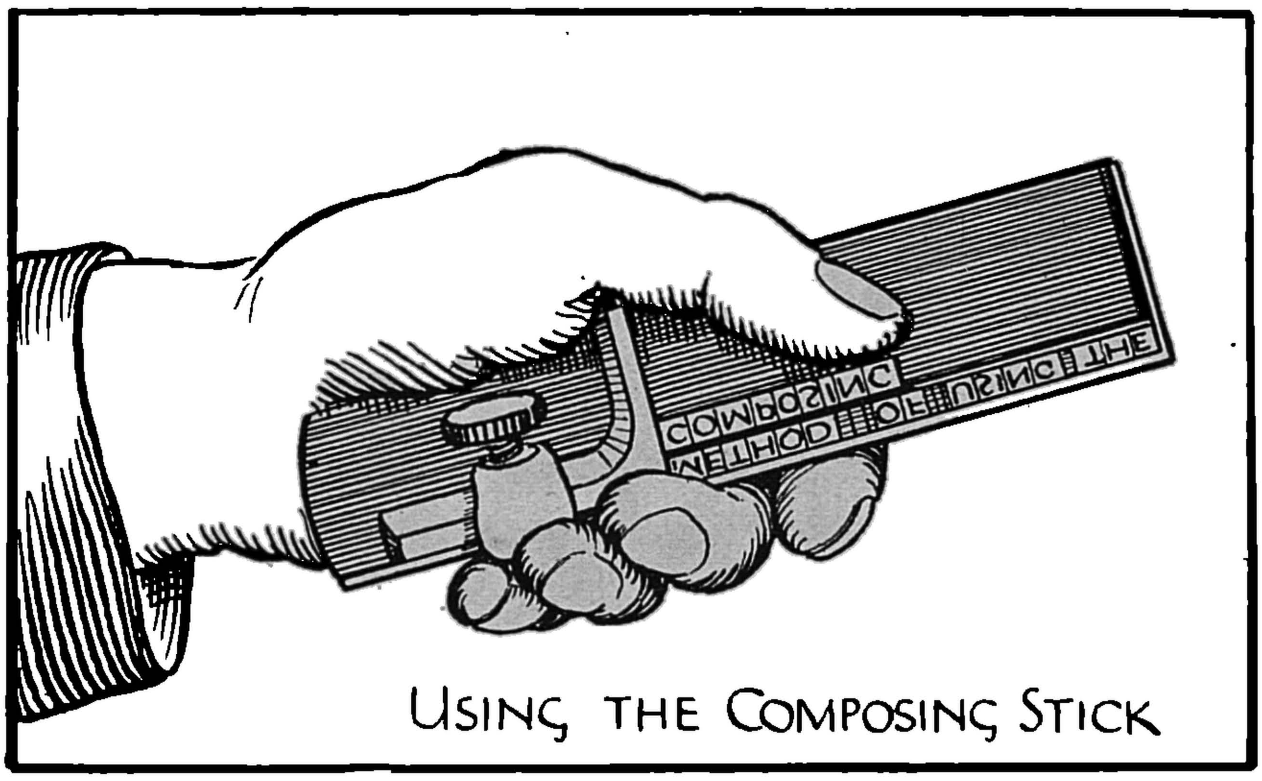


FIG. 41

ent founts, it can soon be detected, by watching them carefully, if a character from a wrong fount has crept in, or if a letter has been inadvertently placed upside-down. Continue setting the type, putting a thick space between each word. In ordinary reading matter each line of type is made to extend the whole length of the stick, and no spaces may be left at either end. In order to accomplish this, it will be necessary to *justify* the line of type. Justification consists of manipulating the spaces between words, changing a thick space for a thin, or perhaps an en space, or *vice versâ*, until the line fits the stick exactly, with the space between words as constant as possible. After a little practice this will not be found difficult, but it must be remembered that

on no account should the adjustment of the composing stick be altered. A correctly justified line should be so spaced that, if lifted a little in the stick, it will not drop. The line is too tight if the last space or letter has to be forced in, and too loose if, on running the forefinger over the completed line, any sideways movement, however slight, can be detected. When the first line has been justified, take out the setting rule and put it, with the addition of another lead, on top of the completed line, and proceed with the next one. Strictly speaking, if leads are used between the lines, the setting rule is not necessary, but it is as well to get accustomed to its use. Although setting rules are specially made in different sizes, from 4 ems to 50 ems, a piece of ordinary brass rule cut accurately to length will serve the same purpose. The setting rule is used in order to provide a smooth surface for the pieces of type to rest upon, so that they will not be caught upon the edges of the types in the previous line.

This procedure, of setting and justifying each line in turn, is repeated, putting a lead between each two lines of type, until the whole of the matter is composed. Watch carefully for errors, and correct them at once, checking each line before proceeding to the next; for, by so doing, the expenditure of much time and patience later on will be avoided. When experience has been gained, the whole of the composing stick may be filled before the type is transferred to the galley, which is the next stage in the work; but at first it will be better to transfer three or four lines at a time. A galley is shown in Plate XIII. In ordinary practice, the matter is first set up in the stick and transferred to the galley, until the whole of the work is set, when the mass of type is tied up and transferred to the imposing stone. The chase is then laid over it, the necessary furniture put round, and the whole is wedged or *quoined* up into a solid mass ready for the press. For

children, however, and when the work is small, the chase can be laid direct upon the galley (Fig. 42), and the type transferred from the stick straight into its position in the chase. By this means two difficult stages are eliminated, tying up the mass of type and transferring it from galley to stone.

The process of transferring the lines of type from the composing stick to the galley needs great care and, until

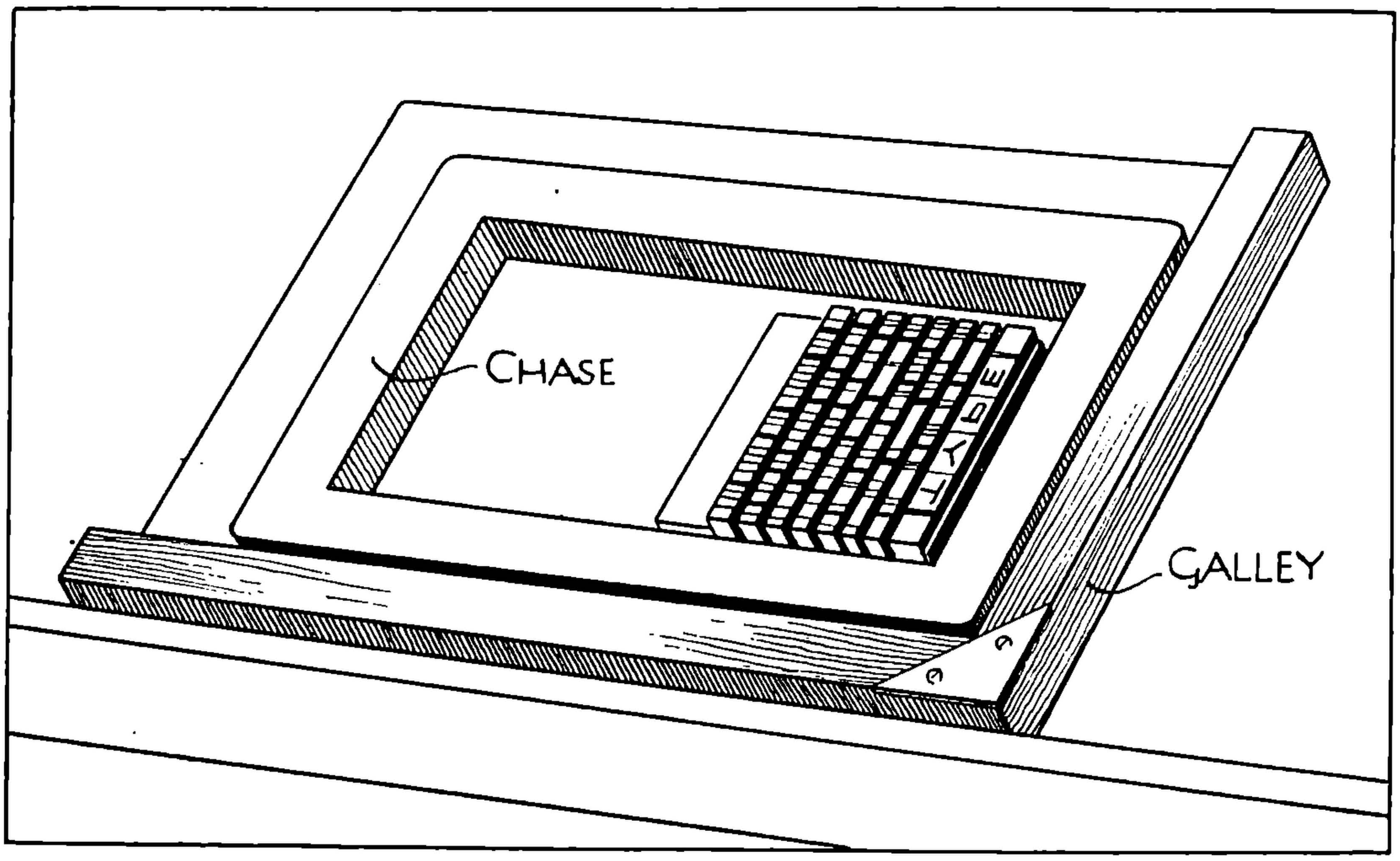
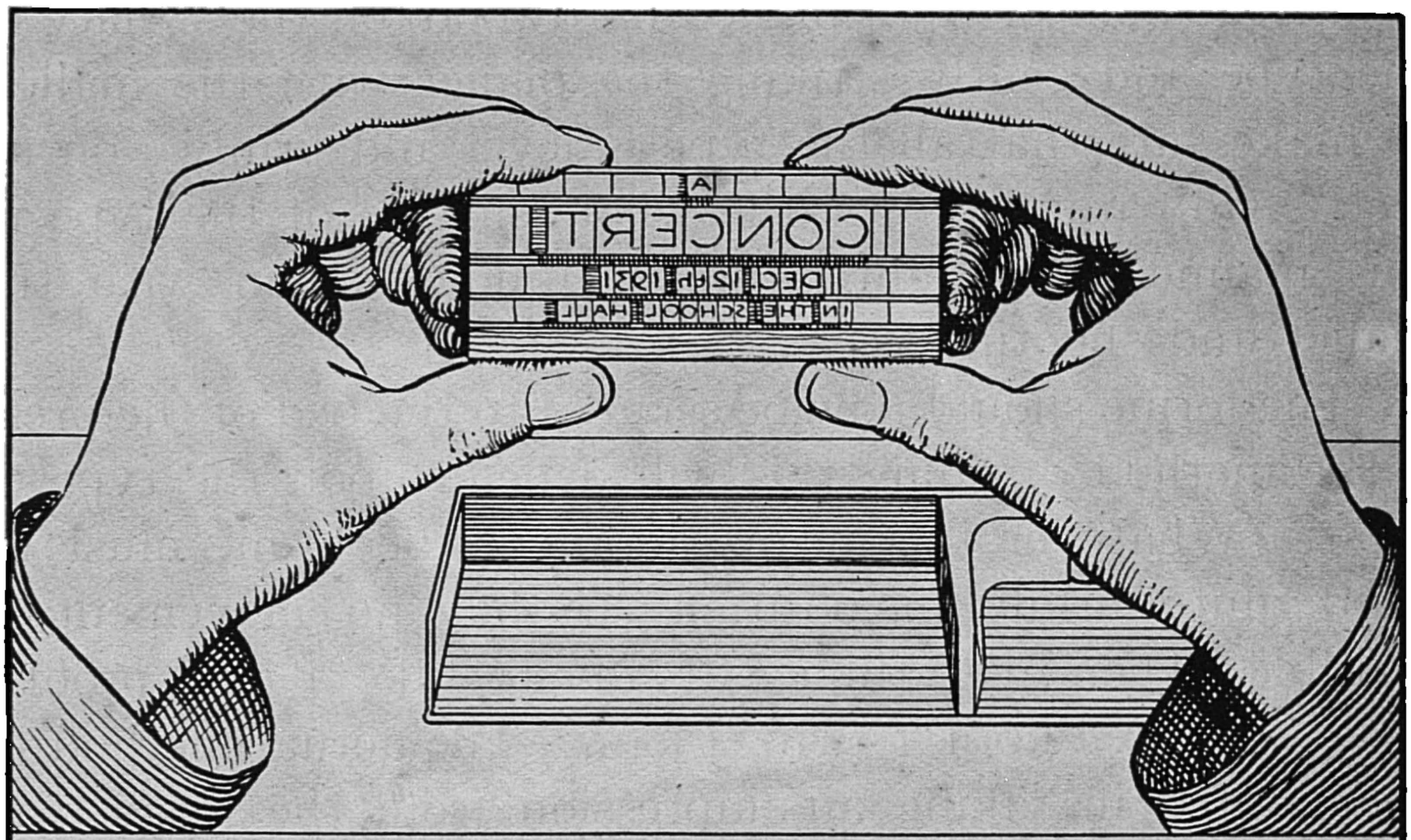


FIG. 42
CHASE LAID UPON THE GALLEY

experience has been gained, will probably result in dropped letters, and perhaps total collapse, ending in *pie*. If, however, the following directions are followed, any difficulty should soon be overcome. Place the stick close to the galley, with the setting rule on top of the first line of type, and with a piece of fairly thick reglet (12-pt. or 18-pt.) below the last line. Grip the type firmly between setting rule and reglet, as indicated in Fig. 43, and gently lift—a little rocking may be necessary—from the stick. Still holding the mass of type firmly between the fingers and thumbs of both hands, place on the galley and keep in position with

a piece of furniture. When the whole of the type has been set up and transferred in this manner to the galley, the work should be spaced out with leads and reglets to the desired arrangement.

The mass of type must now be wedged firmly within the chase in order to produce a solid printing area. This is done by means of *sidesticks* and *quoins*. These are wedge-shaped



LIFTING TYPE FROM COMPOSING STICK

FIG. 43

pieces of oak, the sidesticks being long enough to enclose the whole mass of type, while the quoins are shorter wedges which are driven tightly between the sidesticks and the inner edges of the chase until the type is firmly locked together. The quoins, which are made in a variety of sizes, are first pushed home with the fingers and then driven in tightly by means of a shooting-stick (Plate XIII) and mallet. If each line of type has been accurately justified and the leads and reglets are of the correct length, the type should become practically a solid mass under the pressure of the quoins. To test whether this has been done, slightly raise the *forme*—as the type set up in the chase is now

called—and watch for any loose letters. If everything is firm and tight, remove the forme to the *imposing surface*. This is a perfectly flat plate of metal or slate. If this is not available the forme may be placed straightway upon the bed of the press (should this be of the horizontal type). Next, the operation of *planing* the type must be performed. This is done by loosening the quoins slightly, placing the planer (a small piece of planed hardwood) on the surface of the type and gently striking the planer with the mallet, to make sure that all the type is level and firmly "on its feet." Go carefully over the whole surface of the type in this manner and tighten up the quoins again with the mallet and shooting-stick.

The forme should now be secured to the bed of the press —the method of doing this will depend upon the type of press. Whatever the means adopted, the forme must be fixed quite firmly in position so that no movement is possible. Then everything is ready to take a trial proof.

Taking a Proof in the Press. The actual method to be adopted in taking an impression from the forme will depend, to some extent, upon the type of press in use; but there are many points to be observed which will be common to all. In the first place, the platen will have to be prepared: that is, the wood or metal surface must be covered with one or two thin sheets of card, or four or five thicknesses of paper. Over these, keeping them in position, is stretched a covering sheet of smooth, hard paper.

The inking of the forme should be attended to next. If it is to be inked by hand, a composition hand-roller will be needed. This can be bought from a printers' supply merchant, and is an ordinary hand-roller, similar in shape to that used for photographic purposes; but having the roller covered with a composition made of gelatine and glycerine. A little of the ink, which is supplied in a convenient form in tubes, should be squeezed out upon the

inking slab and well rolled out into a thin film. A flat sheet of metal plate—or better still, a piece of good stout plate-glass—forms an excellent inking slab. When the hand-roller is covered with a thin, even film of ink, it should be passed lightly, but with just sufficient pressure to ink the whole, over the forme. The platen is then brought down on to the type; pressure is applied, the platen raised, and a more or less perfect impression will be found on the platen sheet. If it be an uneven impression, corrections can be made by adjusting the pressure wedges or screws, and finally, if necessary, by what is termed *make-ready*.

MAKE-READY. It often happens that, even with new type and the most careful adjustment of the impression, the proof will be faint in places; perhaps a letter will be missing or appear fainter than the rest. This difficulty is overcome by pasting a small piece of paper over the faint parts of the impression on the platen. For this purpose a piece of thin tissue paper is best. It should be laid over the print, the faint area pencilled round, the piece torn to shape rather than cut—since cutting leaves too abrupt an edge—and fastened in position with as little paste as possible. This make-ready is one of the most important parts of the presswork, and calls for the exercise of much patience and skill. It must not be over-done, or the remedy may be worse than the disease. When a satisfactory print has been obtained, a thin, clean covering sheet should be put over the platen and secured by light touches of paste at the edges, the *gauge pins* inserted, and the gripper fingers adjusted. Gauge pins are small bent-wire pins which are inserted in the platen bed in such a way that the paper or card is always in the correct position for printing. Three are usually employed, two at the lower edge and one on the left-hand side. The gripper fingers should be so adjusted that they are safely clear of both the type surface and the gauge pins. A most important rule to be observed

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—and one which it is particularly necessary to impress upon pupils—is that the gripper fingers *must* be moved outwards after every piece of work, for, if by neglect of this they come into contact with the type surface and pressure is applied, it will mean the ruin of type, and perhaps, in the lighter machines, some dislocation of the press itself.

When a correct impression has been obtained, the proof must be looked through very carefully for errors in setting up, and, if necessary, the forme must be taken out of the press and corrections made. If wrong letters are discovered, the quoins should be loosened, the wrong characters withdrawn with the aid of bodkin and tweezers, and the correct ones inserted. The important point to remember is that any new characters or spaces put in must occupy exactly the same width as those taken out, in order to avoid disturbing the correct justification of the line. If by some mischance, whole words, or even phrases, have been omitted, it may be necessary to re-cast several lines. One or two such experiences will impress upon the compositor the necessity for accurate work and careful checking. Fig. 44 shows a small job locked up in the chase.

When all these details have been attended to, the actual printing may be begun. The appearance of the printed sheets must be watched carefully and the inking kept as even as possible. Care should be taken not to over-ink the work at any time—too much ink is always a sign of the amateur in printing. It will be found that quite a small quantity of ink, well rolled out, will usually give good results; and when the work begins to assume a grey tint, a little more ink should be taken from the ink slab by means of the hand-roller and applied to the ink plate of the press. If the printing is being done on fairly absorbent paper, the printed sheets may be placed on top of each other immediately; but if, however, the paper is at all hard and glossy, or there is a big area of black—as in a

linoleum-cut—the sheets, as they are taken from the press, should be interleaved with sheets of absorbent paper (blotting paper if possible) to prevent the ink "offsetting" and soiling the back of the next sheet placed upon it.

DISTRIBUTING THE TYPE. When the whole of the run has been printed, the forme must be taken from the press

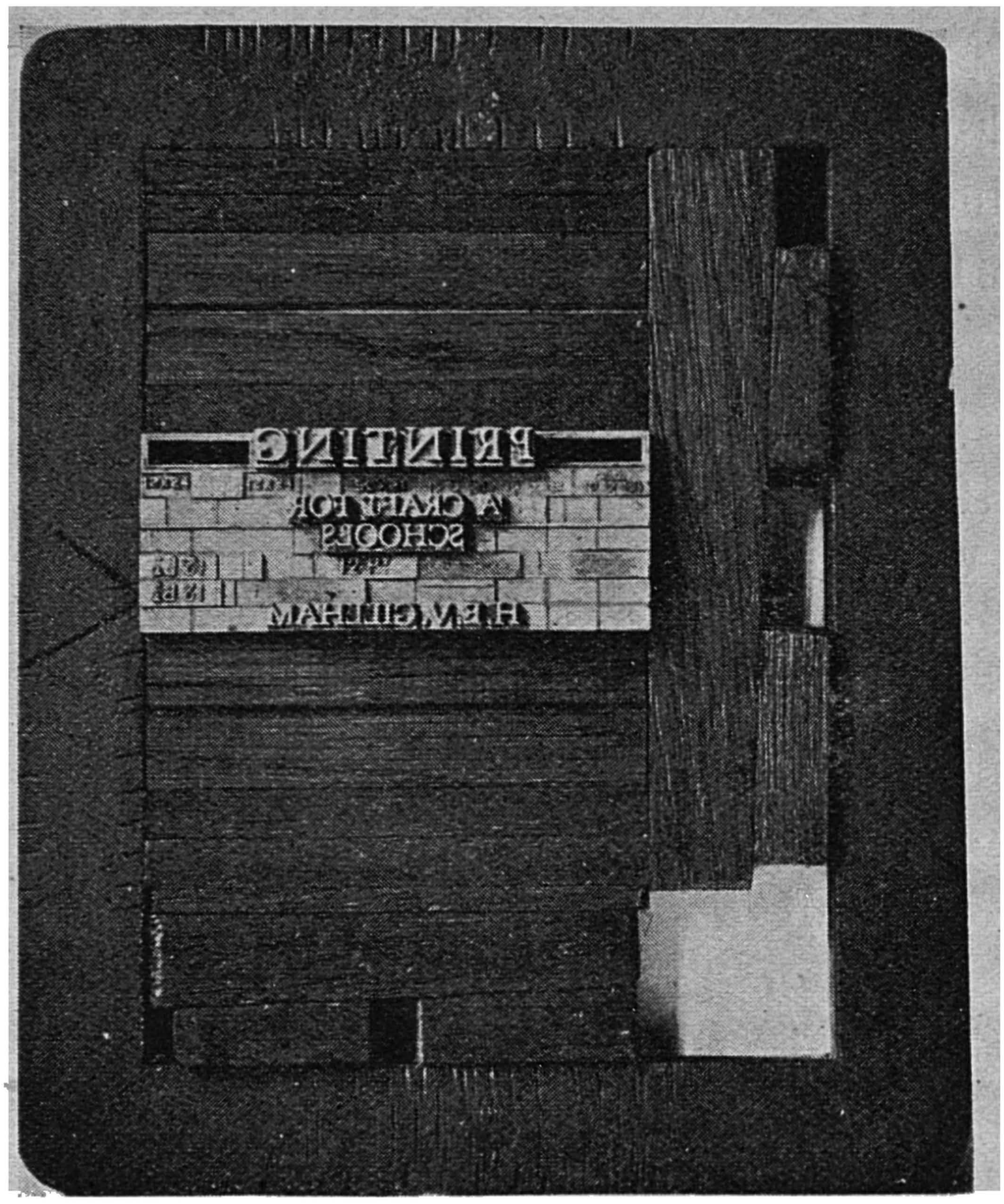


FIG. 44
A SMALL "JOB" LOCKED OR *QUOINED UP* IN THE CHASE

in order to *distribute* the type, i.e. to put each piece of type into its particular position in the case, so that it will be ready for the next piece of work. Before loosening the quoins and sidesticks for this operation, the printing surface of the type should be cleaned of ink. This may be done by using either a piece of rag or a type brush, damped with benzine or paraffin. Afterwards, the type must be wiped dry. Unlock the forme, take out the reglets, and lift a line of type upon the setting rule; with the right hand take a

few pieces of type—a complete word if possible—and drop each character into its proper place in the case. It is the best plan definitely to read each word as it is picked up, as this will lead to fewer mistakes in distribution, and will obviate confusion between such letters as *p* and *q* and *b* and *d*. Continue this process until the whole of the matter has been taken down, being careful that any different faces of type are put into their correct cases; failure to distribute properly always entails difficulties in future composition. When all the type is distributed, the leads, reglets, or other spacing material must be put away into their correct positions.

Finally, the press must be thoroughly cleaned. Remove the gauge pins, slide the gripper fingers along to the end of the bar which carries them, and clean both the inking plate or disc, and the rollers with a cloth dipped in paraffin. If the rollers are to be used again fairly soon, the ink may be left upon them, but they should be put into a dust-proof box, for dust is a powerful enemy to good, clean printing.

PRINTING IN MORE THAN ONE COLOUR. When it is felt that some relief or brightness is required in a piece of printed matter, it is a good idea to set it up in two or more colours. The most common combination is that of black and red, but these are, naturally, not the only colours available; and a close study of good modern printing, especially perhaps the advertising folders and booklets of progressive business houses, will be a revelation in the delightful possibilities of modern colour printing.

As an example, let us take a simple announcement where the main part is in black and one or two lines are printed in red. First set up the whole page in the ordinary way, as though it were to be printed wholly in one colour. Take a proof of this completed forme. Then loosen the quoins, take out all the lines of type you intend to print in red, and in their place insert quads, reglet, or leads of

the same thickness—i.e. of the same point value. What is left will be the black forme, and it may be planed and locked up ready for the press.

The red forme, which must be composed in another chase of the same size as that containing the black, may now be prepared. This is done by setting up upon the galley the lines of type which have been lifted from the black forme for this purpose. They should be spaced out to their correct position with wood or metal furniture, leads, or quads, until they occupy the same position relative to the black lines as they did in the original forme. These positions may be checked by folding the proof down its centre and laying it upon the type, when the correctness of the spacing may be judged. When this red forme has been planed and locked up, the whole job is ready for the press. When the machine and rollers have been inked up with red, pull a proof on thin paper. Lay this upon the first proof of the original completed matter, hold both up to the light, and it will be seen whether the red parts fall correctly into position.

If the setting up of both formes has been satisfactorily completed, the presswork may be proceeded with, working the red forme first. If it is at all possible, it is desirable to keep separate rollers for colour work, as, even with careful cleaning, rollers which have been used for black ink are apt to give the colour a dead look, and prevent clean, bright colour being printed. In printing, great care must be taken to place the paper exactly to the gauge pins each time; otherwise impressions will be spoiled by faulty register.

PRINTING IN GOLD, SILVER, OR BRONZE. Although usually this is a somewhat "fancy" process which does not appeal to the writer—there is nothing like clean black or colour printing—the method may occasionally be needed and is outlined below.

The composing and preparation of the forme for the press is done in the usual way. The printing, however, should be done with a specially-prepared ink sold for this purpose. This is of a bright yellow colour, so that the metallic powder afterwards used loses little of its brilliancy. Use the ink in exactly the same way as in ordinary printing, but, after about fifty copies have been printed, dust over the printed matter with a piece of cotton-wool dipped in the powder; lay the sheets aside for a little while, and then dust off the superfluous metal powder with a piece of clean cotton-wool. A smooth paper or card gives the best result, and the final dusting off must be done lightly to avoid smudging.

Notes on Spacing. Before concluding a chapter on composing and printing, some notes on the spacing of type matter should be added. The degree of spacing to be used in different classes of work will vary according to circumstances, but the general aim of even appearance and the avoidance of gaps should constantly be borne in mind. The usual spacing in "solid" or book work is to place a thick space between words; but, if the type face is of "condensed" characters, a middle space is better; or if, on the other hand, an "expanded" letter is being used, correspondingly wider spaces will be necessary. The end of a sentence, at one time marked by a full em quad, is now, in the more recent practice, treated in the same way as the general spacing between words.

New paragraphs should be indented one em. Too many broken words at the ends of lines should be avoided, and of course, where a word has to be broken, due regard must be paid to correct syllabification, which can always be checked by reference to a good dictionary. It is well to avoid also, if possible, the last line of a paragraph consisting of a single word, and certainly there should be enough matter in this last line to cover the indentation of the succeeding paragraph.

In ordinary, thick-spaced matter the colon and semicolon should be preceded by a thin space and followed by an en space. Interrogation and exclamation marks should have a middle space before them and be succeeded by two thick spaces. Thin spaces should be placed within the opening and closing inverted commas of a quotation.

CHAPTER IX

ILLUSTRATION

THE type of work it is possible to do on the school printing press is not restricted to letterpress only. The earlier chapters of this book indicate methods of making pictorial blocks which may easily be adapted for printing in the press, and can be used either by themselves or in conjunction with type matter.

LINOLEUM-CUTS. The most obvious solution to the problem of illustration or decoration lies in the linoleum-cut, which has already been fully considered. The only fresh problem encountered is that of mounting and preparing the linoleum so that it may readily be set up with type. The final block, of course, must be exactly type-high. This mounting is an operation which calls for extreme care if difficulties are to be avoided later in getting an even impression from the complete forme. The method which has been found most successful by the writer is described below. Procure a piece of good, clean wood (American whitewood or a good quality deal is suitable) of such a thickness, that, when the linoleum is mounted on it, the block will be about $\frac{1}{8}$ in. thicker than the height of type—i.e. it should be a little over 1 in. With a sharp, well-set plane, dress one side until it is as flat as possible. By means of seccotine, or a good liquid glue, secure the linoleum to this surface, either weighting it or using cramps until the glue is set. In doing this, be careful that the surface of the cut is not damaged in any way. When this is set, plane the four edges of the block perfectly square and to the size required. A shooting board will be of great assistance in doing this. It is very important that these edges should be square: if they are not, they may throw a whole forme

of type "off its feet" and, when an impression is taken, it will be found that only the top, or one side of each character is printed. The final problem is to get the correct thickness. Lay the block upon a flat surface (the imposing stone or a piece of plate-glass); place a piece of ordinary brass rule against each edge in turn and scribe a line round its top edge. If the block be planed down very carefully to this line, the correct thickness for insertion into a forme of type will be produced. Actually, for a linoleum-cut, it may be an advantage to have it just a shade thicker than type-high, owing to the softness of the material compared with the metal type. If it is necessary to increase the thickness of the block —whether it be a linoleum-cut, a zincograph, or a half-tone block—paper (or even card) of a necessary thickness may be stuck, with touches of paste, to the bottom, and trimmed round with a sharp knife.

FIG. 45
LINOLEUM-CUT USED AS ILLUSTRATION IN SCHOOL MAGAZINE

Figs. 45 and 46 show examples of linoleum-cuts which were mounted and prepared in this way, and used in conjunction with a page of type for the illustration of a school magazine.

FIG. 46
LINOLEUM-CUT INITIAL LETTERS FOR MAGAZINE

WOOD ENGRAVINGS. These are extremely suitable for the illustration of printed matter, but they are not so generally available as linoleum-cuts, because they are much

more difficult to produce successfully and the materials are more expensive. The same disadvantages apply in a measure to wood-cuts.

LINOLEUM PRINTS IN COLOUR. The linoleum-cut is especially suitable for the production of a colour print, since it is easy to cut the blocks necessary for printing the broad, clean masses of colour which are the feature of such work. The method of obtaining the pattern for each block is the same as that for hand printing in colour, described in Chapter III. The black or key block should first be prepared and cut, and a reproduction of this transferred by the offset method to the necessary number of other blocks. Extreme care must be taken over this process: each block should be placed in exactly the same position in the chase as the key block before receiving its impression from the damp print, otherwise the final print will be out of register. It is well to design the black block with fairly generous border lines, and to cut the colour patches on the remaining blocks a little large, trusting to the final imprint of the key block to mask any irregularities in register. The frontispiece shows some of the possibilities of pictorial colour printing. Nos. 1 and 4 were illustrations used in the school magazine, while No. 3 was designed and cut by boys for the cover of a Sports Day programme. Plate XIV is interesting as showing the progress through the press of a colour print. In carrying out the presswork, it is, of course, necessary to print the whole run from each block in turn, so that if 100 copies are required from a four-block print, 400 printings are necessary. It is well to bear in mind the labour involved when designing colour prints, and to keep the number of colours employed as low as possible. In using

ATHENS

FIG. 47
"HOUSE" DEVICE
WOOD-ENGRAVING
AND TYPE

colour in the press, it is best to try to keep a separate roller for colour printing: although, if the black roller and the press are cleaned thoroughly, except for a slight dulling of the colour, little difficulty will be experienced. The necessary inks can be bought in small tubes, and may be mixed in much the same way as oil colours, as long as they are thoroughly rolled out and incorporated with each other.

In printing, great care must be taken over the insertion of the paper into the press: each piece must be placed exactly true to the gauge pins *every time*, to avoid spoiling prints through faulty register.

The process of producing linoleum colour prints is one demanding some degree of efficiency and ability, but given this, extremely pleasing results may be obtained. If the press is large enough, attractive exercises consist of the reproduction of a small poster or showcard, or flower and fruit studies for wall decoration, after the manner of the excellent colour prints from wood blocks popularized by Hall Thorpe.

FRET-CUT BLOCKS. Another method of making blocks, which has its advantages, is that usually known as fret-cutting. The design, which must be of a plain, bold character, is drawn in reverse upon the surface of a thin board, ordinary 4-mm. plywood is very suitable. The outlines are then cut round with a fretsaw, and the resulting shapes glued, under pressure, in their correct position upon a mount of a thickness sufficient to bring the completed block to the correct height for printing in the press. The printing surface of the plywood must be smoothed thoroughly with fine glasspaper *before* the cutting is done (if left until the block is completed, rounded edges will probably be produced and sharpness lost). This method of cutting blocks has been used to some effect in the printing of fairly large posters. It is also a method by which, if sufficient care be exercised, it is possible to produce home-made "poster" type. The

larger poster type used by printers, by the way, is normally made of wood, being cut as a rule, from the end grain of maple.

THE LINE BLOCK. The ordinary line block, which is used commercially for the reproduction of black and white drawings (in which there are no "half-tones"), is generally not available for school printing, on account of the expense involved. For the production of a line block, it is first necessary to prepare the drawing in good black ink on white paper. The blockmaker (it is not possible to make a zinc line block, as it is usually understood, within the school) then photographs the drawing upon the surface of a zinc plate which has been covered with a sensitized coating. By various developing processes the drawing appears upon the zinc plate as a "resist" against the corrosive action of acid, and the whites are left bare zinc. The plate is then coated on the back and edges with a resistant varnish and etched in the acid bath. The result is that the black lines and masses appear in relief on the block. The plate is then cleaned, trimmed, and mounted so that the final product is type-high. Most of the illustrations in this book are printed from line blocks of this kind.

THE USE OF LINE BLOCKS IN COLOUR PRINTING. It is possible, and under some conditions it may be advantageous, to use a zinc line block as the key block for the process of printing in colour from linoleum blocks, described on page 91. Generally speaking, however, unless the line block be of a bold character (in which case a genuine linoleum block is better and much cheaper) the result will be an unsatisfactory mixture of what is essentially a line process with one producing flat masses, and such a combination, unless handled by someone with a full knowledge of each, is rarely productive of the best results.

MAKING ETCHED ZINC BLOCKS AT SCHOOL. Although the process, of which the essentials have been described

above, is obviously too complicated to be attempted at home or in school, the actual etching process may be employed in a simplified form for the making of blocks. The following is a brief description of the method used.

Procure some perfectly flat, 16-gauge zinc, and cut from it a piece of the size required for the block. Some Brunswick black, or what is generally sold as stove enamel, will be wanted for the resist, and some turpentine with which to thin it to a workable consistency. An earthenware or enamelled iron dish to contain the acid—which is hydrochloric—will also be needed. The necessary precautions in dealing with acids must, of course, be observed, and the work should be carried out under the direct supervision of the teacher.

The first step will be to provide a slight tooth to the zinc by wiping over the polished surface with a rag moistened with acid. The metal must afterwards be rinsed thoroughly in water to arrest the action of the acid. The design must then be transferred to the zinc by any of the usual tracing methods—reversal, of course, being necessary.

The black portions must then be painted over with the resistant Brunswick black. A fine brush should be used for this purpose—so that obviously the method is not capable of producing a great many thin lines—and it may be necessary to dilute the paint with turpentine. When this painting is hard and dry, the edges and back of the plate must also be painted over. The plate is now ready to be etched. Another way of preparing the block for the acid bath is to paint the whole plate with the resist and to scrape away the design. In a sense this is a white line method, as opposed to the black line design made with a brush.

The etching may now be begun. The plate is immersed in the acid bath, and the biting will soon be detected by the formation of bubbles on the unprotected parts of the zinc. These bubbles must be gently brushed aside from time to

time by means of a feather, in order not to impede the full action of the hydrochloric acid. When biting is judged to be sufficient, it will be seen that the black parts of the design stand up above the level of the rest of the block, in much the same way as in type.

FIG. 48
ETCHED ZINC BLOCK

The protective coating is then removed from the whole plate by gently warming and cleaning with turpentine; and it will then be necessary to mount it type-high, securing the zinc to the wood mounting block by drilling fine holes and using small brads or pins. The block is then ready for making up together with type, and for printing in the usual way.

Although the use of commercially-made line "zincos" will probably be rare in school printing, the method outlined above will produce interesting results after some little practice. Figs. 48 and 49 are examples of blocks made in this way; the former by the black line method (painting with a brush), and the latter by the white line method (where the design is scraped away before etching).

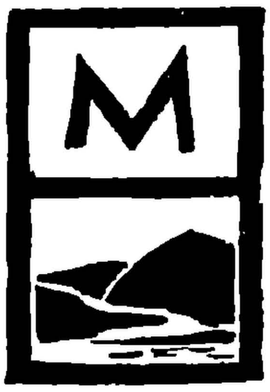
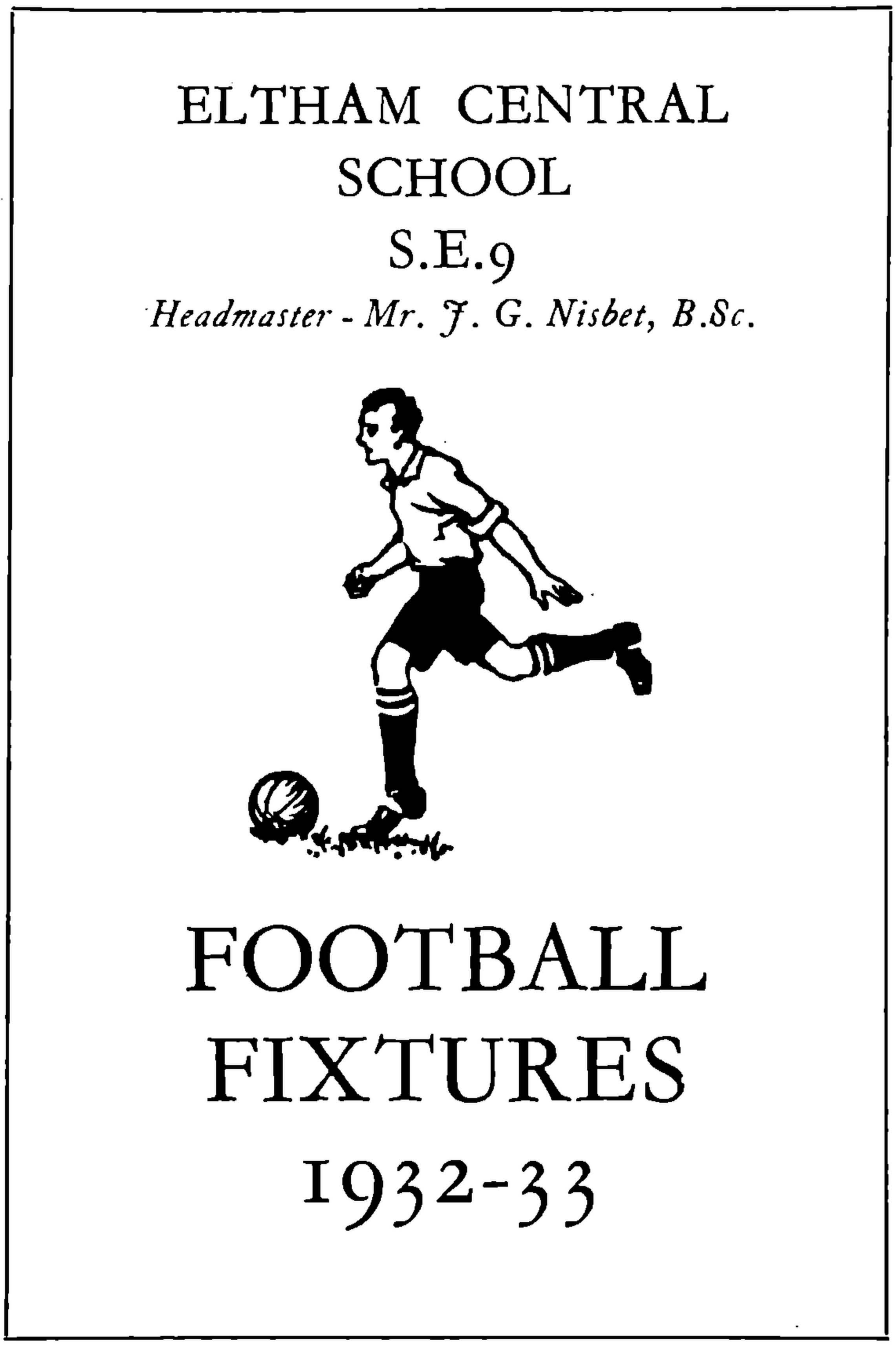


FIG. 49
ETCHED
ZINC
BLOCK

It is possible also to buy what are known as "stock" blocks, which may occasionally be useful for certain purposes. The figure of a footballer or cricketer may, for instance, be used for fixture cards or programmes (Fig. 50). These blocks are usually what are known as "electros"; that is, reproductions of an original zinc line block, made by a process of electro-deposition: a wax mould is made, on which is deposited, by electrical means, a film of copper. This copper shell is afterwards backed up with stereotyping metal and mounted type-high.

Half-tone Blocks. By means of a half-tone block it is possible to reproduce photographs and wash drawings which contain a full range of tone, and not merely black



ELTHAM CENTRAL
SCHOOL
S.E.9
Headmaster - Mr. J. G. Nisbet, B.Sc.

FOOTBALL
FIXTURES
1932-33

Fig. 50
FOOTBALL FIXTURE CARD

and white. The making of a half-tone block by the process engraver is a complicated piece of work, but consists essentially of the following steps. The original is photographed through a screen interposed between the design and the plate. The effect of this screen is to break up the photograph into countless tiny dots, which may be observed in any newspaper or magazine photograph. The fineness of

THE INTER-HOUSE TROPHY

Winners 1931–32—Sparta

The House Trophy was awarded for the fourth time on Prize Day, 1932. The successful house this year was Sparta, and the captains, Joan Wade and Victor Digby, are here seen after the presentation. Congratulations, Sparta!

Photograph—Mr. Doran

Plate XV

PAGE FROM SCHOOL MAGAZINE, SHOWING HALF-TONE BLOCK

the screen employed depends upon the type of paper used. The best results are obtained by using a fine-screened block printed upon a very smooth, highly-glazed paper. For cheaper, rougher papers, such as "newsprint," a coarser screen is used. The metal (copper in the case of half-tones), which now bears a resistant image, is then etched in much the same way as a line block, but not so deeply; it is then cleaned and trimmed, and mounted type-high on a block of wood.

Half-tone blocks are not likely to be used much on the school press. In the first place, their cost is prohibitive, and secondly, a really good press is necessary in order to print them satisfactorily. For occasional use, such as for special illustrations in the school magazine, they may be found useful—Plate XV is one such. Great care is necessary in the make-ready and printing to ensure satisfactory results. However, they can be almost perfect as far as the mechanical reproduction of a picture goes, if they are well printed on good paper.

Of these various methods of illustration it will be found that, for school purposes, the most natural, the easiest and most generally satisfactory one is that of linoleum-cutting. This is so, not only because of the expense involved in the commercially-produced blocks, but because it is productive of the work most direct and fresh in design.

CHAPTER X

SOME USES OF THE SCHOOL PRESS

THE various processes involved in printing and the possibilities of illustration and decoration having been dealt with in some detail, something may be said in this chapter of the practical use to which this acquired skill and knowledge may be applied. It was stated in the early pages of this book, almost axiomatically, that whatever is made should be worth the making, and while, in the adult world, much of the matter turned out by the printing presses is of little permanent value, for—

"Of the making of books there is no end"

—yet this is hardly likely to be true of whatever is produced on a school press. Suggestions having already been made of the many ways in which a school press can be employed, the purpose of this chapter is to deal with the various projects in a more detailed fashion.

BOOK-PLATES. One of the first things a boy wishes to do, once he has learned to compose type, is, somewhat naturally, to set up and print his own name. This desire may be turned to good account by letting him produce a book-plate, which he may, when finished, insert into his school textbooks and readers. This book-plate may consist simply of the name set up in appropriate type and enclosed within a border of type ornaments or fancy rule, or it may be made the occasion for designing a linoleum or wood block and using it in conjunction with type. If an illustration be used, the *motif* for the design may often be suggested by the name itself, whereby the book-plate acquires a peculiarly personal and interesting quality. An example of such a book-plate is shown in Fig. 51. As mentioned earlier in the book, care should be taken—as far as it is possible with

the resources available—to choose a type which will harmonize with the bold masses of a linoleum- or wood-cut.

Book Markers. While presenting another useful application of the use of illustration combined with type matter, this is a similar problem to that contained in the book-plates, and is still a project which is not too long or tedious.

Fig. 51
LINOLEUM-CUT BOOK-PLATE

Tickets, Handbills, and Programmes. Here again, the advantages of possessing a school press are obvious, since all these are required fairly often in the life of a normal school. For the actual methods and styles of setting out these various pieces of work, careful study of the output of good professional printers is recommended—remembering that one safe rule in typography is to use, as far as possible, one style of type in any one "job," and to avoid discordant mixtures. Even in one style or family of type there are usually four or five different faces, which have the same characteristic features in design. Thus, in setting up a piece of display work the whole of the following five faces might be used—

Caslon Old Face,
Caslon Old Face Heavy,
Caslon Old Face Compressed,
Caslon Old Face Italic,
Caslon Old Face Heavy Italic,

in different sizes, but the result would be harmonious because they all have the same basic characteristics in design, and can thus safely be used together.

Football Fixture Cards. Such a piece of work as that illustrated in Figs. 50 and 52 includes one or two processes in printing which have not hitherto been mentioned. The front half of the folder—the title page, as it were—is

FOOTBALL FIXTURES

FIRST XI—CENTRAL SCHOOLS

Opponents	*Opponents' Grd.*	*Date*	*G.*	*Result*	*Date*	*G.*	*Result*
Woolwich	Charlton Park	17 Sep.	H		3 Dec.	A	
Downham	Ladywell Rec.	24 Sep.	A		10 Dec.	H	
Brockley	Blackheath.	1 Oct.	H		17 Dec.	A	
Bermondsey	Blackheath.	8 Oct.	A		14 Jan.	H	
Crofton Park	Ladywell Rec.	15 Oct.	A		21 Jan.	H	
Catford	Catford	22 Oct.	H		28 Jan.	A	
Balgowan	Beckenham	29 Oct.	A		4 Feb.	H	
Charlton	Charlton Park	5 Nov.	A		11 Feb.	H	
Plumstead	Bostall Heath	12 Nov.	H		18 Feb.	A	
Greenwich	Blackheath.	26 Nov.	A		4 Mar.	H	

SECOND XI

Ancona Road	Bostall Heath	10 Sep.	A		29 Oct.	H	
Henwick Road	Avery Hill	17 Sep.	H		5 Nov.	A	
The Gordon	Avery Hill	24 Sep.	A		12 Nov.	H	
Plum Lane	Avery Hill	1 Oct.	H		19 Nov.	A	
Wickham Lane	Bostall Heath	8 Oct.	A		26 Nov.	H	
Wood Street	Charlton Park	15 Oct.	A		3 Dec.	H	
Woolwich Central	Eltham Park	22 Oct.	H		10 Dec.	A	

Home Grounds: First XI—Eltham Park, Second XI—School Field.

Fig. 52

FIXTURE CARD—EXAMPLE OF RULING

embellished with a stock block of the kind mentioned in the previous chapter. The inside of the card is an example (rather a difficult one) of ruled work. The brass rule must be cut very accurately to definite point sizes, and then the various pieces are assembled with the type and locked up in the usual way. A lead and rule cutter is almost essential for such work as this, although much can be done with sets of brass rule sold already cut to a useful assortment of standard sizes. Although perhaps a long and tedious piece

of composing, it is not really difficult if care be taken over the justifying, and the point values of all leads, spaces, and quads are remembered. Pieces of type, known as metal rules (——), are sometimes used either singly or in quantities instead of brass rule. The short vertical lines between the headings in the original of Fig. 52, for example, were these metal rules.

Where there is a very complicated piece of horizontal and vertical ruling to do, it is sometimes the easiest and most economical practice to do the work in two printings—any letterpress and the horizontal lines in one operation, and over-printing the vertical lines in a second working. By this method, although the presswork is doubled, the labour of much rule cutting and setting is avoided.

Creasing. Where cards have to be folded down the middle, as in the football fixture list above described, a useful way of dealing with a large quantity is to "crease" them in the press. For this purpose the rollers are taken off, and a piece of rule mounted in the chase so that it produces a crease in the correct position on the card when pressure is applied. Special steel creasing rule is sold, but for short runs the ordinary brass rule works quite well. If the pressure be properly adjusted, this gives a well-defined crease in the card, making its correct folding a simple and speedy matter.

Perforating. Special rule may also be bought for perforating; such rule has a sharp serrated edge that is a little higher than type. The rule may be used at the same time as the type is printing, if care be taken to adjust the padding on the platen so that the rule cuts well but does not interfere with the impression of the type.

Rhyme-sheets. The opportunity should be taken, where it is possible, to link up printing with the art work, and perhaps other branches of the school curriculum, such as the English teaching. It may, for instance, be necessary

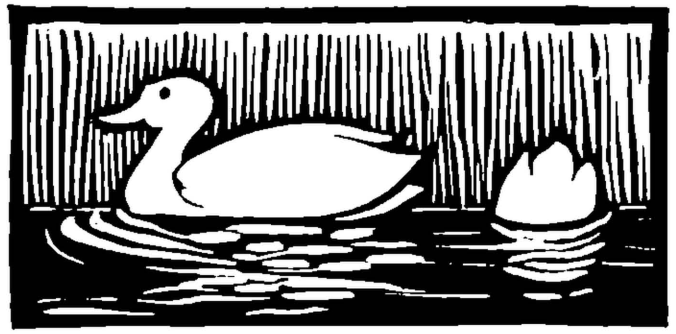
to reproduce, for class work, a selection from English literature—poetry or prose. The broadsheet produced should be worthy of the subject, and care should be taken over the arrangement, choice of type, and the decoration, if any.

The making of rhyme-sheets always provides interesting work. They may be executed in a variety of styles. One method is to print the poem on a strip of paper, leaving a blank space at the top of the sheet, in which, during the art lesson, a suitable imaginative drawing or painting can be placed. The next is to provide the illustration only, in the form of a linoleum-cut, printed at the head of the strip, and to use the poem as an exercise in the formal writing with a broad pen, advocated in Chapter V, letting the children write it out below the printed picture. With well-chosen poems, this is especially suitable for young children. Finally, the rhyme-sheet may be treated, with the senior scholars, wholly as a printed piece of work—the design for the decorative heading, the block-cutting, and the type-setting and printing being carried out from start to finish by the children.

Examples of rhyme-sheets, involving linoleum-printing and practice in formal writing, are shown in Plate XVI.

BOOKLETS AND FOLDERS. Where a folder of four pages (or an enlargement of this into a multiple of four to make a booklet) has to be printed, a good deal of forethought and planning will be necessary. The size of the paper, both flat and folded, must be taken into account, as it relates to the size of the press and the area required for the printed page. In a four-page folder, with the size of press available, it may be necessary to carry out four printings, one for each page. Where, however, it is at all possible, the double page—the paper opened out flat, as in Fig. 53—should be the unit of printing, and not the single page. In trade printing on large presses as many as sixty-four pages are printed in

Whither, O splendid ship,
thy white sails crowding,
Leaning across the bosom
of the urgent West,
That fearest not sea rising
nor sky clouding,
Whither away fair rover,
and what thy quest?



Yes, ducks are valiant things
On nests of twigs and straws,
And ducks are soothy things
And lovely on the lake
When that the sunlight draws
Thereon their pictures dim
In colours cool.
And when beneath the pool
They dabble, and when they swim
And make their rippling rings,
O, ducks are beautiful things!

Plate XVI
RHYME-SHEETS

the one operation; but on school presses it will usually be possible to print only the two, or, in the case of a small booklet and a relatively large press, perhaps four pages.

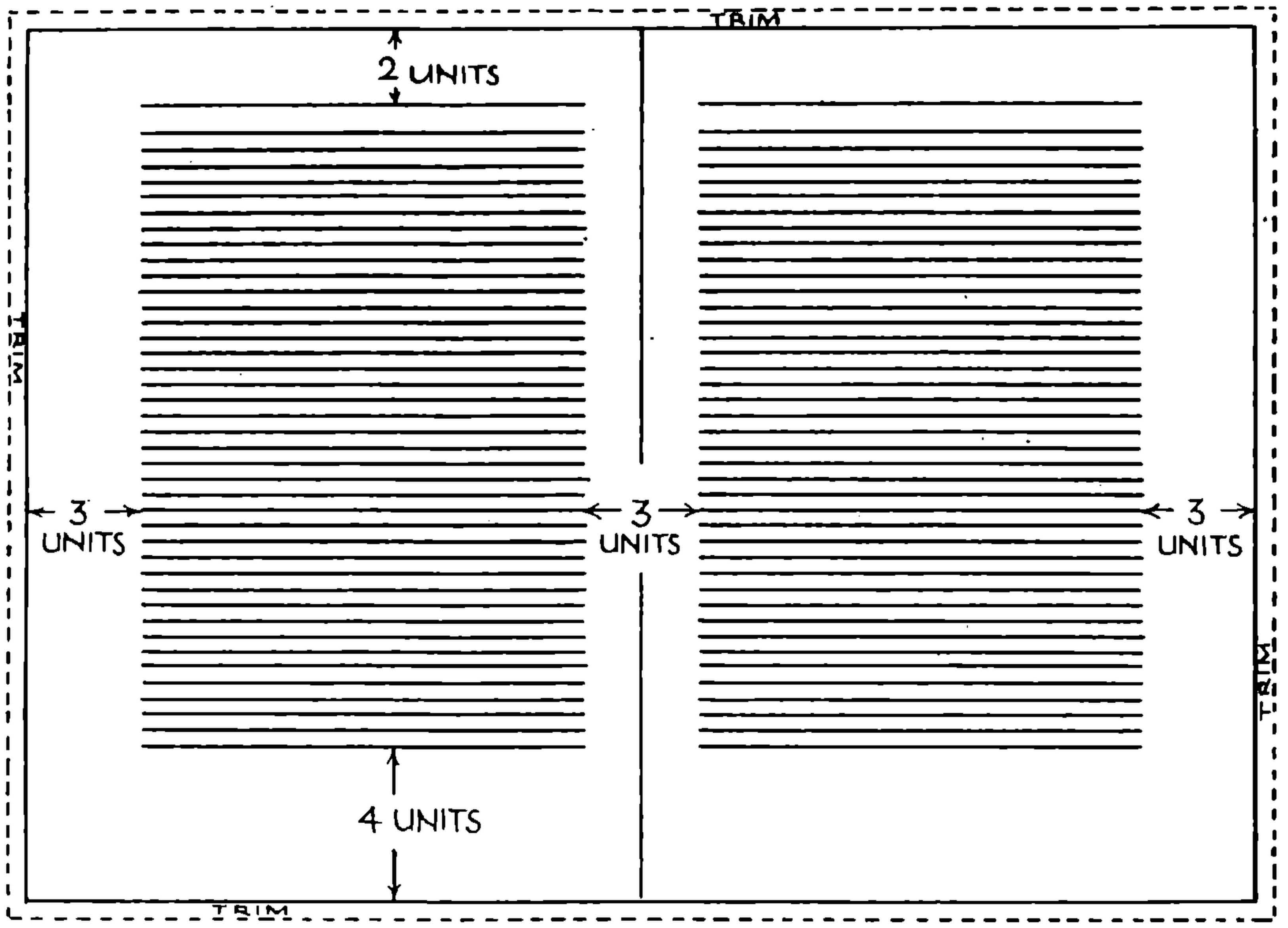


FIG. 53
PROPORTIONS OF PAGE

The matter should be carefully arranged so as to produce balanced pages, which may entail the counting of words and the calculation of the number of lines to each page. Careful consideration should be given to the margins of the page, a safe traditional proportion for these is given in Fig. 53.

CHAPTER XI

PRODUCING THE SCHOOL MAGAZINE

THE production of a school magazine is probably the most ambitious piece of work the school press and its adherents will be called upon to do. It is not the sort of undertaking to enter upon without careful thought and planning; the production of one issue alone means a considerable amount of work. If, however, this is allowed for, and the band of printers is felt to be sufficiently keen and to possess enough perseverance to carry through a moderately long piece of work, there are few examples of printing craft which prove so interesting in execution. In the production of a school magazine the pupils feel that they are doing a piece of real worth-while work—as, indeed, they are. And, of course, to be able actually to print and publish the magazine, as well as to write it, renders the result a much more distinctive school effort. To turn, however, to the practical details of the task, perhaps the best plan will be to describe the procedure of the printing and publication of a school magazine which actually came within the writer's experience. Similar circumstances and facilities may not be generally available, but, nevertheless, the suggestions contained in such a description may be useful to those contemplating work of this kind.

In the first place it is decided that the magazine shall not be published at definite, pre-arranged intervals, but that an issue shall be put in hand at such times as the committee responsible for it feel to be suitable. This attitude, it is hoped, will prevent any lack of freshness in the magazine, which might result from the feeling that it must be issued at regular intervals, whether there be sufficient good "copy" or not. (It was anticipated—and it has actually

worked out so in practice—that about two issues of the magazine would appear each year.)

Next comes the question of the size and style of the booklet, and the size of the edition. The latter problem is perhaps the easier to solve. The solution will, of course, vary with the type of school, and the anticipated sale for the magazine. In the writer's experience, it was found that the first number was quickly disposed of, and that

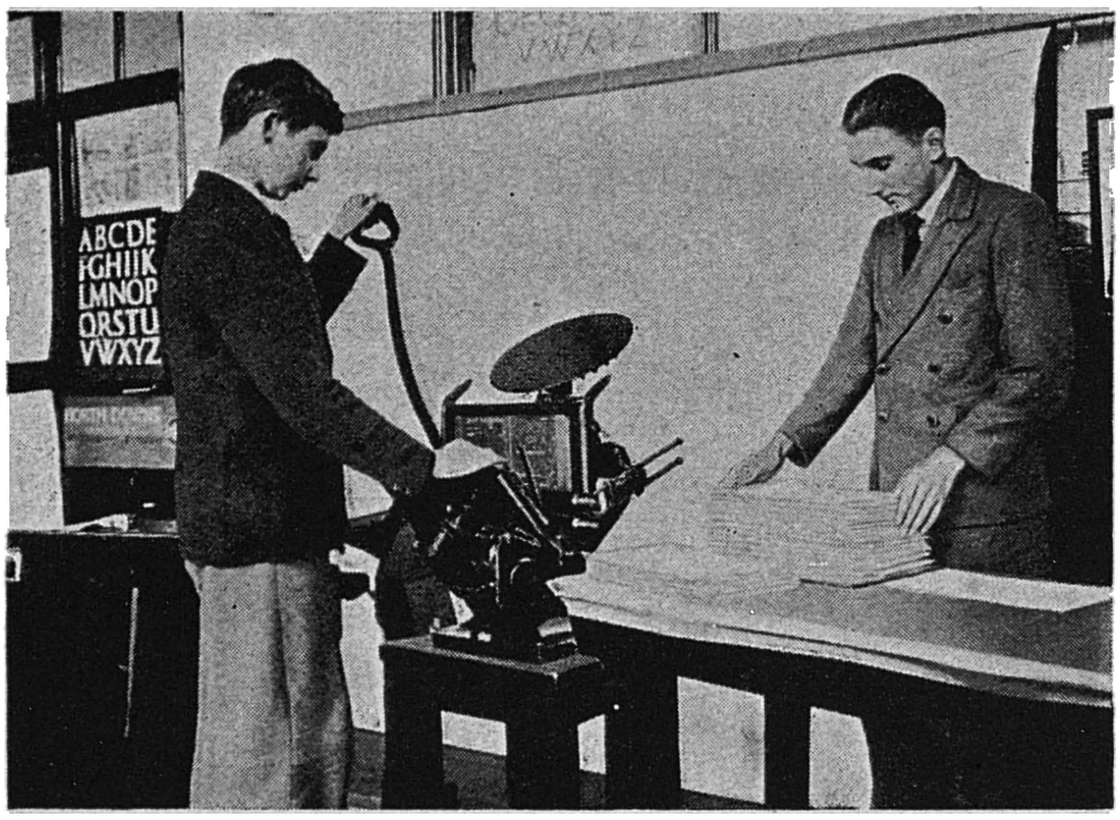


FIG. 54

PRINTING THE SCHOOL MAGAZINE

many more could have been sold. First numbers of most school magazines, however, sell without difficulty: the real test of success is with the succeeding issues, and then only can the size of the edition be judged with any degree of accuracy.

In this particular case, although a good deal of school printing has been done on small hand-presses constructed at the school, it is felt that these resources are not enough for tackling so large a piece of work as the magazine. It is decided, therefore, to invest in a hand-platen press of the type shown in Fig. 35 (page 68), which will eventually be paid for by the proceeds of the magazine. This, by the way,

works out quite soundly as a business proposition, as anyone who has had experience of the financial side of such publishing will realize. The press chosen is capable of printing a sheet 12 in. × 8 in., which is a most convenient size for printing two pages at a time (the actual press is shown in use in Fig. 54).

In addition to the press, a fair quantity of type, enough to set up at least three pages at once, with a corresponding supply of quads, spaces, and leads, is purchased. The style of type needs consideration: in this case 12-pt. Caslon Old Face, with 12-pt. Old Face Heavy for the titles and headings, and some 12-pt. Caslon Old Face Italic are chosen.

EDITING THE MAGAZINE. While this part of the work does not directly concern the printer, it may be well to note in passing that, in general, the aim of its producers was two-fold: first, to record and reflect as fully as possible the life of the school, its varied activities and achievements; and secondly, to supply a means of expression for exceptional literary, journalistic, or artistic ability in the scholars.

The actual selection and arrangement of the copy is not the work of the printer, but he is able to indicate how many pages can be incorporated in the issue without saddling himself and his assistants with too big a task. This, however, is an important point, and it will be well if the first number is of a fairly small size, but is produced as well as possible—quality, not quantity, being the aim. The size of the magazine can always be enlarged if this be felt desirable.

After the *copy* has been selected by the editor, the whole of the literary content is typed out in a uniform manner—fortunately typewriting is one of the subjects taught on the commercial side of the school—so that each line of typescript is approximately equal to the line of type as it will appear in the finished book. A few experiments will

soon establish this relation of printed matter to typescript, and it is a great help in the arrangement of the pages.

A "dummy" booklet is then prepared, and the typescript cut with scissors and arranged on the various pages, allowing room, if necessary, for any illustrations or decora-

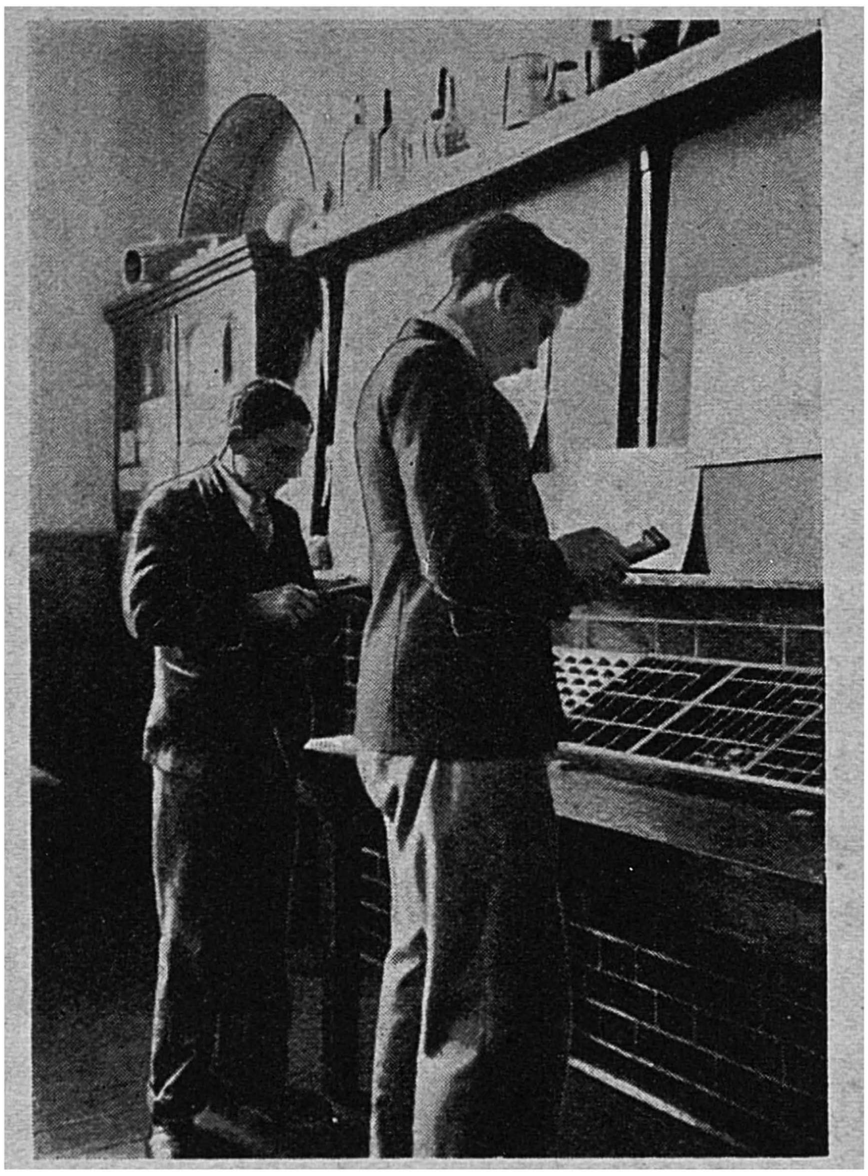


FIG. 55
SETTING-UP TYPE FOR THE SCHOOL MAGAZINE

tion. If this preparation of the dummy be carefully done, the printing of the double page works out fairly easily. This dummy is then handed over to the compositors, who begin their work. (Fig. 55.)

It will be obvious that if the booklet be made up of a number of folders, the flat sheets, except the middle one, will not consist of pages which "follow on." In a twenty-page booklet, for example, page 1 will be on the same sheet as page 20, page 2 with page 19, and so on. This is where, if it has been prepared properly, the dummy will solve many difficulties.

The actual type-setting is perhaps the biggest part of the work, and care should be taken to make it as easy as possible by thoughtful organization and attention to detail. As many boys as possible are engaged on this work—four or six. A wooden composing stick, such as that described in Chapter VII, is made for each, the maker being careful to ensure that the sticks are all of exactly the same measure. Then, if each compositor takes a paragraph in hand, it is surprising, after a little practice, how quickly a double page can be set up. The text of the pages may be set either *solid* or *leaded*, i.e. the lines of type may touch each other or be separated by leads. However, even if the page is to be set solid, leads should be used until a perfectly clean proof of the matter has shown it to be free from errors. Only then should the leads be taken out, for it is extremely difficult for pupils to make corrections in a forme where the type is set solid.

When illustrations are inserted in a page of type, great care must be taken to see that the edges of the blocks are perfectly square; any fault here will, perhaps, throw several lines of type "off its feet," and clean printing will be impossible. It is well to cut blocks to definite sizes measured in picas (one-sixth of an inch); this will lessen difficulties in justification.

When the pages are complete upon the galleys (Fig. 56), they are slid on to the imposing table and locked up in the chase. In producing a booklet of this nature, it is important to see that each double page falls in the same position on each side of the paper. If a piece of good printing be held up to the light, it will be seen that the type matter occupies the same position on both sides—that is, the pages *register*. The easiest means of ensuring this register is to keep the furniture which surrounds the type, including the piece which separates the two pages, the same throughout the whole work. The chase of the machine used is a

"screw-chase"—where the locking up is done by means of screws working in the right-hand side and bottom of the chase—in many ways a more convenient method than the usual "quoining-up."

When the whole of a double page is locked up, proofs are pulled and submitted to the editor and others for

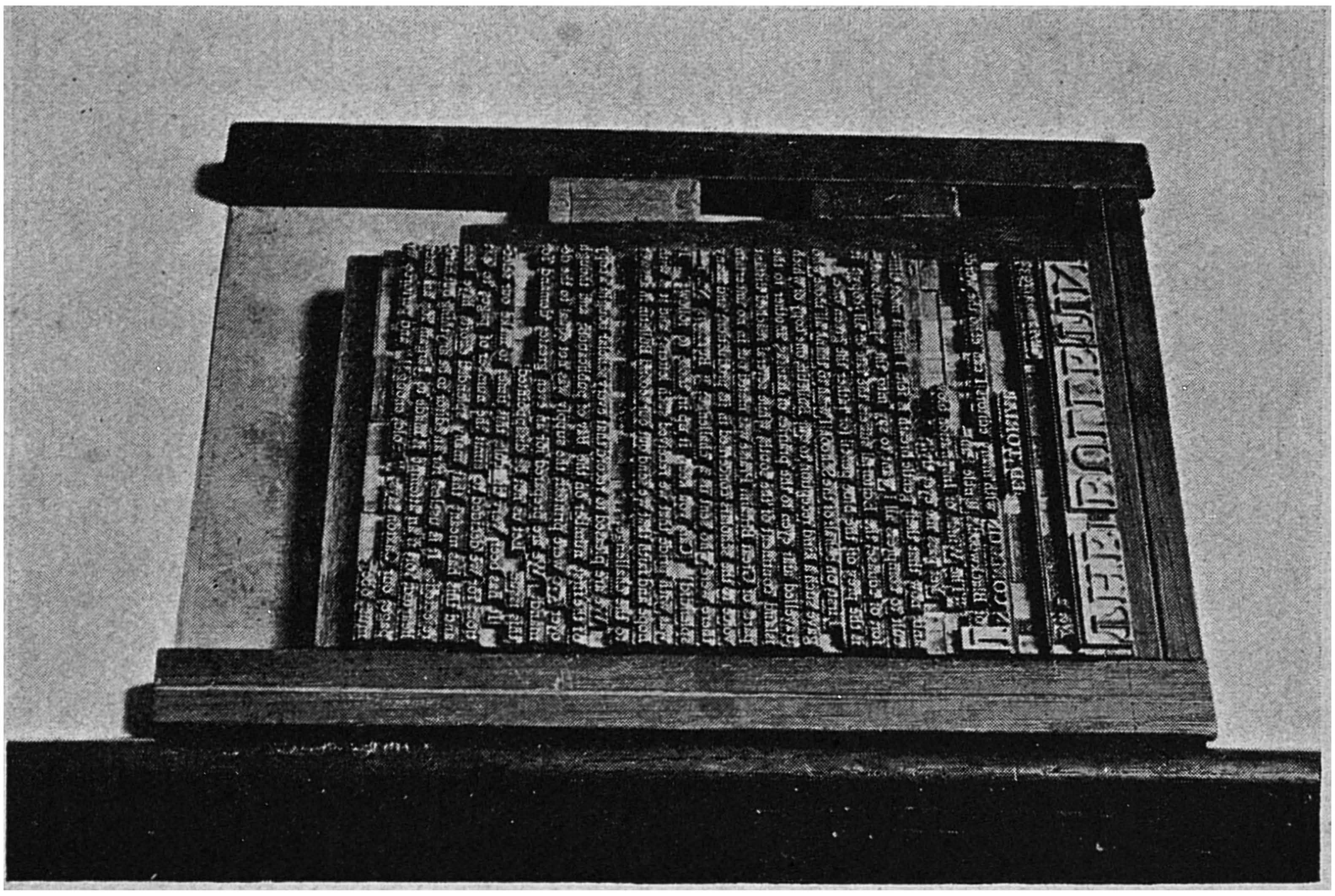


FIG. 56
A PAGE COMPLETE UPON THE GALLEY

reading and correction. It is advisable to get two or three people to look through for errors, otherwise it is surprising how easily they can be overlooked. The necessary corrections are then made, the pressure and the make-ready on the press finally adjusted, and all is ready for the printing.

The question of the paper to be used needs some consideration. Whatever the surface, as good a quality as can be afforded should be bought. If much illustration is contemplated, a smooth, glazed—but not too highly glazed—"imitation art" paper is suitable; but if the printing consists only of letterpress, a thicker, softer, and more

absorbent "antique" paper is good, upon which it is somewhat easier to obtain a good impression.

When the magazine is finally assembled ready for stitching, some waste will occur unless the number of copies of each sheet printed has been carefully watched. In spite of trying to keep a check upon the number of sheets run through the press, such waste actually occurred in the first issue of the magazine. Later, an impression index (adapted from a small revolution counter of the Veeder cyclometer type, which cost a shilling), was fitted to the press, which accurately registered the number of impressions made, and solved this difficulty.

In the actual presswork, two or three boys are employed at a time; one to see that the printer is readily supplied with paper, one to operate the press, and the third to take the printed sheet from the press and to interleave it with a cheap absorbent paper to prevent offsetting. When the necessary number of copies of one sheet is printed, the forme is taken from the press and the type cleaned and distributed; while at the same time the preparation of the next forme is going on.

When the whole of the printing has been completed, the task of folding and assembling the magazine is undertaken. Other helpers, after a little instruction, fold the sheets at intervals as soon as they are dry from the final printing. The assembling and "knocking-up the heads" of the books is done as a class exercise. Treated in this way, it does not take long to get the whole edition ready for binding.

For the wire stitching and final trimming of the edges, the assembled books are taken to a local printer, who does the work very quickly and at a small charge, after which they are returned to the school, ready for publication.

CHAPTER XII

PRINTING AND ART EDUCATION

It was claimed in the opening pages of this book that the craft of printing—using the term in its broadest sense—carried with it exceptional opportunities for the realization of the two main aims in craft education—the acquisition of manual skill, and the fostering of the artistic impulse in children. It is hoped that the suggestions and examples contained in the foregoing chapters have, in some measure, justified this claim.

Many of the crafts which it is possible to introduce into the school curriculum are probably as valuable as printing in their potentialities for developing manual dexterity, but no other, in the writer's opinion, is linked so closely with what may be termed the æsthetic growth of the child.

To define what is understood by art is too much a matter of opinion to attempt here, and it is always a problem to decide where craftsmanship ends and art begins (if the two can thus be separated at all), but it is at least certain that there is no surer way to the heights of art than along the road of fine craftsmanship. In a sense, of course, all art teaching is impossible, since art is an expression of the spirit, but at the least, we can, in teaching the practical details and manipulations of a craft, give the fullest opportunities for such expression. It is here that printing and its associated forms of graphic art possess such decided advantages, particularly if, as a result of early interest in printing processes, the pupil goes on to one or more of the finer developments of the art, such as engraving, etching, or lithography.

The fostering of the creative impulse, however, although

perhaps the chief aim, is not the only one. It is a commonplace that the more practical knowledge we have of a craft, the more discerning and critical we are likely to be of its productions. It must also be accepted that with the majority of children the practice of any form of creative work will cease as soon as schooldays are over; perhaps few will become craftsmen, and fewer still, artists. But an important function of our art teaching should be not only instruction in the technique of various media, but in the setting or raising of the standard of taste in things artistic. Children (or adults either, for that matter) cannot be taught what is to-day termed "Appreciation of Art," but they can, and should, be surrounded with such examples of good work as will unconsciously lead them to appreciate what is best in the arts. To interest them in printing, which is still the most widespread and powerful means of recording and conveying ideas—and particularly, in these days of cheaply-produced illustrations, ideas of form and colour—is to open up a vast field which must surely lead to an increased power of appreciation. The standard in printing and book production has risen enormously since the opening of the present century; modern type faces are among the most beautiful ever designed; the illustration of books, particularly by the means which must be regarded as the most suitable for association with type, i.e. by wood engraving, is, at least in England, of a very high standard; while the general make-up or *format* of the best modern books leaves little to be desired.

There is no reason why the child's knowledge of, and interest in, the craft of printing should cease at the stage beyond which he himself is unable to carry its practice; there are whole fields of more advanced processes, developed along artistic or scientific lines, in which he should be interested and, if the teacher himself is keen about the subject, he will find many opportunities for short talks on

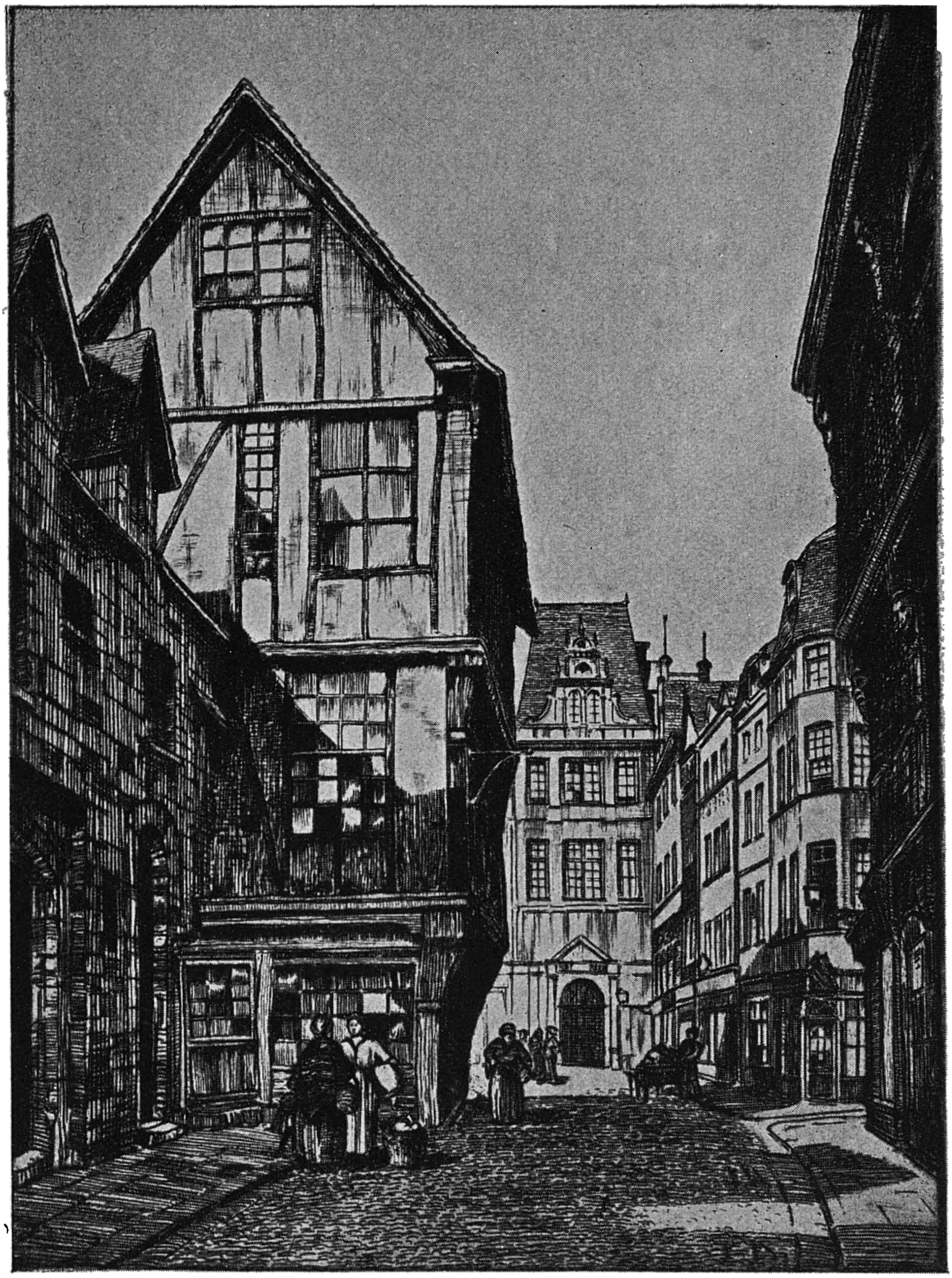


PLATE XVII

Rue St. Romain, Rouen

ETCHING BY THE AUTHOR

The original is an example of *intaglio* printing

these, and for the exhibition of specimens of printing outside the scope of the school craft.

Broadly speaking, for instance, methods of printing may be divided into three groups: *relief* printing, *intaglio* printing, and a number of processes which have been described as *planographic*. There is not sufficient space in a book of this kind to do more than briefly indicate the nature of these three processes.

Relief printing, which is the only method that has been dealt with in these chapters, consists of the process of printing from type or blocks in which the printing surface stands up in relief. This is the most commonly used form of printing, and is exemplified in the use of ordinary metal type, line and half-tone blocks, wood-engravings, and linoleum-cuts.

There is, however, another group of processes called the intaglio method of printing. The main forms of this are known as engraving or etching; processes hitherto employed much more as a form of artistic expression than as ordinary commercial methods. The principle upon which intaglio printing depends is that the printing ink is not deposited on the surface of a relief block, but is held in lines or recesses formed in the polished surface of a metal plate, either by engraving or by being etched out with an acid. The polished surface is wiped clean, and by the application of great pressure the paper is forced to pick up the ink contained in the engraved spaces, producing the image.

One of the most frequently seen forms of intaglio printing is in the art of etching. The practical details of the craft are relatively simple, but to achieve results at all worth while demands a degree of artistic ability and sensibility beyond the range of most pupils. Experiments might, however, be made in the medium by any of exceptional ability among the older pupils.

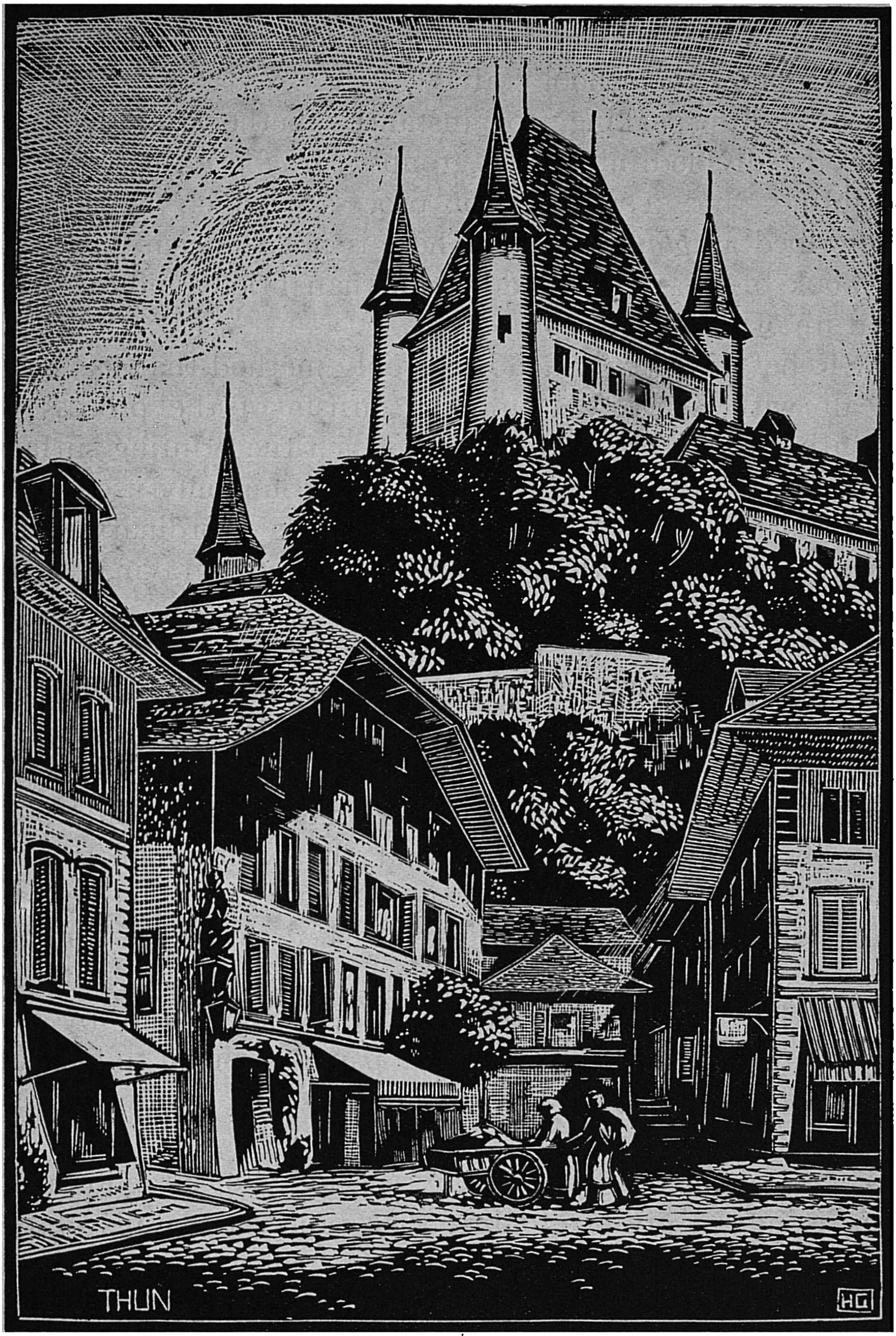


PLATE XVII

Thun

WOOD-ENGRAVING BY THE AUTHOR

Another common example of intaglio printing is seen in engraved visiting cards or letter headings, but it often calls for some degree of experience and knowledge to determine when these are genuinely printed from engraved plates and when they are only imitated by some process of letterpress printing. The intaglio method is being used in an increasing degree for such commercial processes as photogravure, in which the plates are mechanically etched by the aid of photography.

The third great branch of printing—*planographic*—is chiefly exemplified by what is termed lithography, where the printed image is produced, not from a relief block or an engraved plate, but from the surface of a perfectly flat stone (in the most recent practice, specially prepared metal plates are taking the place of the stone, but the principle remains the same). The process depends for its action upon the lack of affinity between fat and water. In brief, the subject is drawn—in reverse—with a greasy ink or crayon upon the surface of the stone. The stone is then moistened, and when it is "inked-up," the ink is accepted by the greasy image but repelled by the moist (blank) parts of the surface; paper is superimposed, a scraping or rolling pressure is applied, and the print is produced. Lithography is the method in general use for producing coloured posters.

An elementary knowledge of the principles underlying these printing processes will promote interest in, and appreciation of, all forms of printed matter. Much useful work may also be done by calling attention to the historical aspects of the craft; old manuscripts, old books and engravings, the work of the great master engravers, etchers, and printers, and the development of the printing press as outlined in Chapter VI. A most useful means of awakening interest, however, by reason of its being the most readily accessible, is the collection and exhibition of good examples of printed matter, fine illustration and decoration, good

examples of lettering and type faces, well made-up pages, and, if possible, fine examples of bookbinding.

All these suggestions, it is hoped, will persuade the teacher who is seeking for some means of bringing fresh life into his teaching of art or craft work that the craft of printing, in one or other of the forms indicated in the foregoing pages, has at least some claim to his serious consideration.

For the children, much will have been accomplished if, whatever the means adopted, they are led to feel—even if it be imperfectly and at rare intervals—sympathy with the poet when he says:

I love all beauteous things,
  I seek and adore them;
God hath no better praise,
And man in his hasty days
  Is honoured for them.

I too will something make
  And joy in the making;
Altho' to-morrow it seem
Like the empty words of a dream
  Remembered on waking.

Robert Bridges.

APPENDIX

GLOSSARY OF PRINTING AND TYPOGRAPHICAL TERMS

Ampersand. The sign &, a contraction for *and.* (From *&, et.*)

Ascenders. Lower case characters with strokes that ascend—h, b, l, etc.

Batter. To injure the face of the type.

Bed. The part of the press upon which the forme is laid.

Bodkin. A steel point used in making corrections in a forme of type.

Box. Brass or zinc rules set round printed matter to form a frame.

Brass Rule. Strips of type-high metal varying in thickness from 1–12 point, used to print lines, plain or ornamental.

Broadside. A sheet printed upon one side only.

Cases. Wooden trays to hold type.

Cedilla. The mark placed below the letter "ç" (as in façade) as an indication of pronunciation—ç has the soft "s" sound.

Chase. The iron or steel frame in which type, blocks, etc., are locked up for the press.

Composing. The assembling or setting-up of type.

Composing Stick. Often termed the "stick"; an accurately made tool in which type is composed, used to ensure that every line is of exactly the same length.

Copy. The matter to be set up in type.

Descenders. Letters like p, q, etc., with descending strokes.

Distribute. To break up, sort, and return composed type to its case. This should be done immediately it is certain that no more copies will be needed.

Dwell. The brief period during which the sheet is allowed to remain pressed to the surface of the type, necessary for setting the ink.

Electro. A duplicate block made by depositing, by means of electrolysis, a copper shell upon a wax mould of the original. The shell is afterwards backed up with type metal and mounted type-high.

Em. The printer's unit of square measure. The square of any body —thus a 12-pt. em is twelve points deep and twelve points wide.

Em Dash. Sometimes termed "metal rule"—used in punctuation.

En. Half an em.

Forme. The type, blocks, etc., after being locked up in the chase ready for printing.

Fount. A complete set of type made up of the correct proportions of all characters.

Furniture. Wood spacing material in thicknesses of 36-pt., 48-pt., 72-pt., and 92-pt. Usually supplied in 36-in. lengths.

Galley. A shallow metal tray to which the composed type is transferred from the stick.

Gauge Pins. Wire pins inserted in the platen bed so that each sheet lies in the correct position for printing.

Gripper Fingers. Metal strips on the press for holding securely the paper to be printed.

Half-tone. A half-tone block reproduces photographs in a complete range of tones as opposed to the simple black and white of a line block.

Imposing Stone. A flat surface of metal or slate upon which the assembling of type, blocks, etc., is done prior to locking up in the chase.

Impression. The amount of pressure of the forme against the platen.

Indent. To put a quad at the beginning of a paragraph.

Job. The piece of work to be set up and printed.

Justify. To space out lines of type exactly to a given length.

Kerned Letters. A kern is the part of a letter which projects over the body of another type; "f" is usually a kerned letter, and kerned letters are very frequent in italic founts.

Leaders. The dots or dashes used in a line of type to lead the eye from something at the beginning to something at the end, e.g. in price lists—

Gauge pins .. .. 6d.

Leads. Strips of metal used to space out lines of type.

Ligatures. Two or three letters cast as one character, e.g. fi, ffi.

Line Block. A block which prints only black and white, as opposed to the full tone rendering of half-tone blocks. Sometimes called "Zincos" (Zincographs).

Locking-up. Wedging the type securely in the chase by means of quoins or screw pressure.

Lower Case. The small letters of a fount, so termed because they are kept in the lower case of the composing frame.

Make-ready. Preparing the platen bed in order to obtain a perfect impression upon the paper or card.

Measure. The width to which matter is to be set; counted in 12-pt. ems, or picas.

Metal Furniture. Metal spacing material used to avoid the slight springing which follows from the use of too much wood furniture.

Off its Feet. Type not standing correctly, but inclined to one side, whereby it is impossible to secure correct impression.

Offset or Set-off. The spoiling of a sheet by the wet ink from another. The term *offset* is also used for an important modern system of printing where this is turned to good account.

Overlay. To paste layers of thin paper on the bed of the platen to obtain a good impression.

Perfecting. Printing the second side of a sheet.

Perforating Rule. Brass or steel rule slightly higher than type, and with a dotted or broken face, which indents and perforates paper.

Pica. The printer's unit of measure, $\frac{1}{6}$ in., or twelve points.

Pie. Type in mixed and confused condition.

Platen. The movable plate which carries the paper to be printed, and impresses it upon the forme.

Platen Bands. Two iron bands which secure the paper bed or padding to the face of the platen.

Point. The unit of measure for type sizes: 72 points = 1 in.

Poster Type. Larger size of type, usually cut in wood, for printing posters.

Proof. A first trial impression from a block or forme.

Proof-reading. Reading and correcting errors in a proof, and checking it with the original copy.

Quadrats (or Quads). Spacing material for type. Made in three sizes: 2-em, 3-em, and 4-em.

Quoins. Wedges made of hard wood—oak or beech—used to wedge the mass of type securely in the chase.

Register. 1. To adjust colour blocks so that each prints in correct position to secure a perfect result.

2. To print pages so that the type areas back each other exactly.

Reglets. Wood spacing material in 6-pt., 8-pt., 10-pt., 12-pt., 18-pt., and 24-pt. widths. Made in lengths of 36 in.

Running-head. The title of a book placed at the head of each page.

Sans-serif. Lettering of a plain, severe type, without serifs.

Score. To crease card in order to ensure accurate folding.

Serif. The small cross-lines at the top and bottom of a letter.

Setting Rule. A brass rule of special shape used in the composing stick to help in easy and quick setting of type. Made in various lengths.

Shooting Stick. A wooden or steel tool, driven with a mallet, used to tighten the quoins and secure the type within the chase.

Sidesticks. Wedge-shaped lengths of hard wood placed at the side of the mass of type. Quoins are placed between these and the inner edge of the chase to lock up the type.

Sorts. Odd or extra letters of a fount required by the compositor.

Stabbing. Wire stitching a booklet or book section through from front to

back and not through the middle fold; the method has the great disadvantage that the book will not open flat.

Stereo. A duplication, made by moulding and casting, of a block or forme of type.

Type High. The exact height of type—approximately $\frac{15}{16}$ in., or ·918 in.

Underlay. Paper, thin card, etc., placed under the forme or block in order to obtain a good impression. Used as a coarse adjustment before the final make-ready or overlay.

Wood Rules. Made in various thicknesses and designs, generally used for poster work.

Zinco. A line block etched in zinc.

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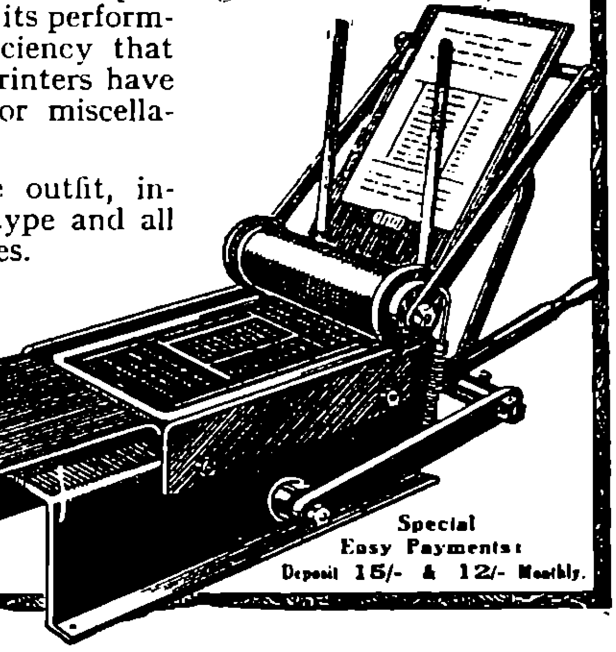

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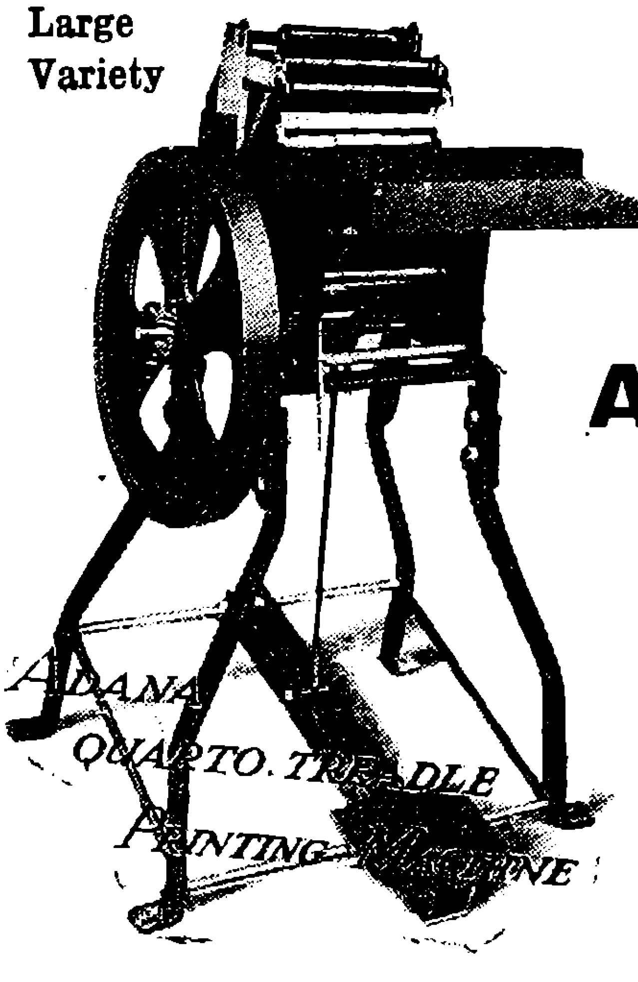

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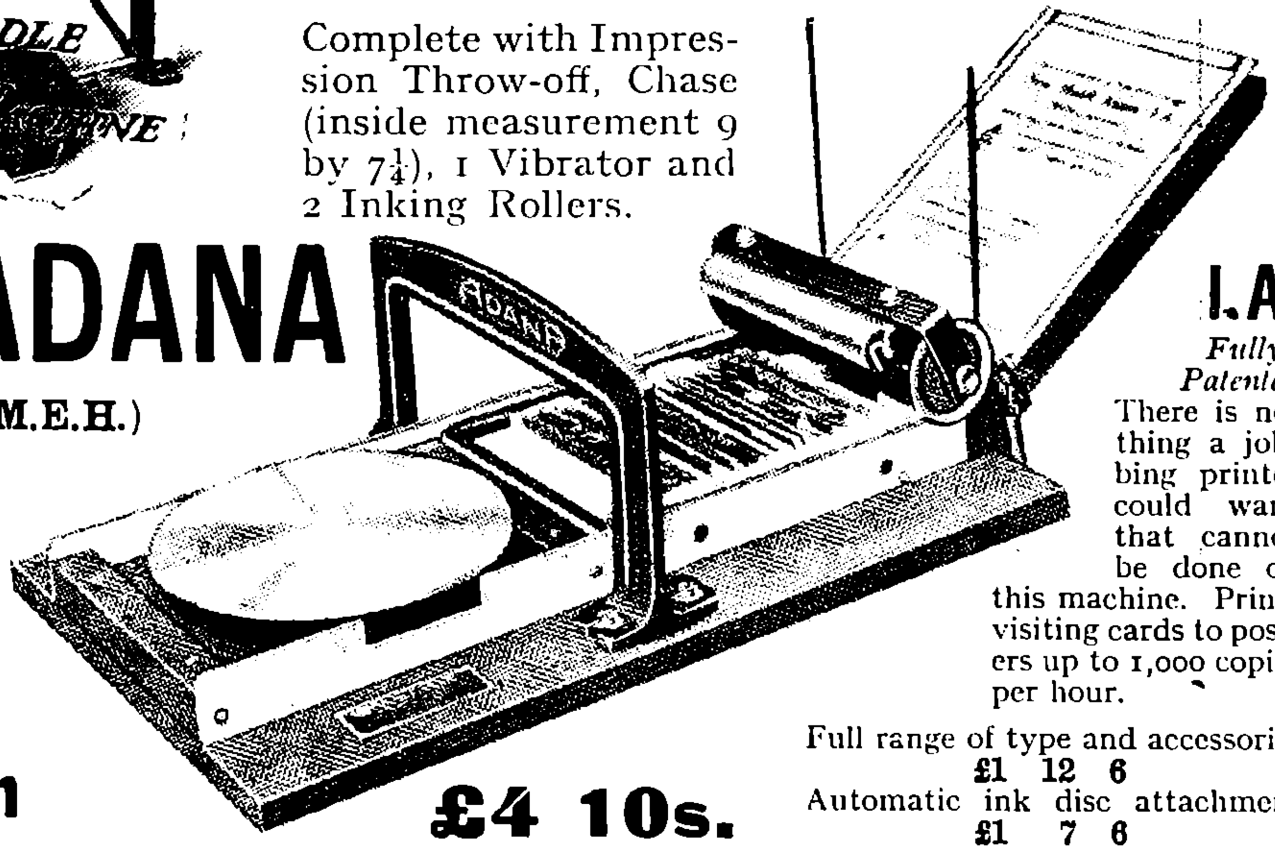

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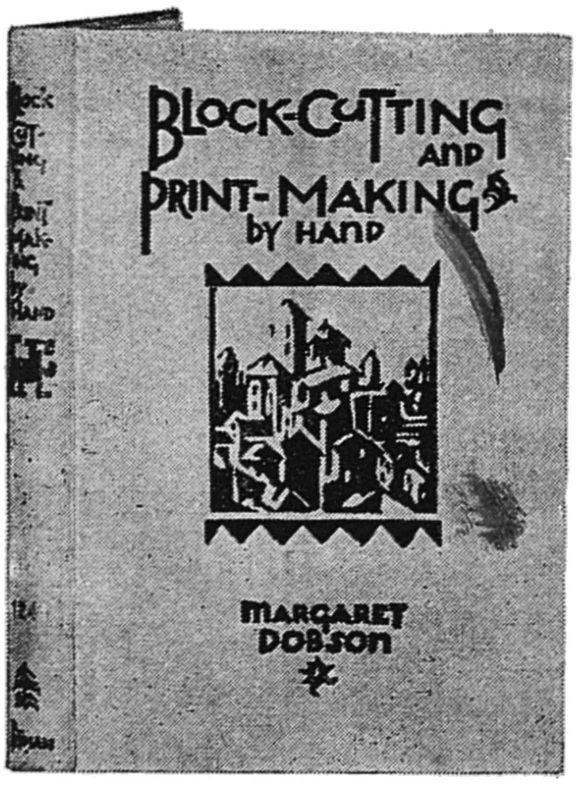

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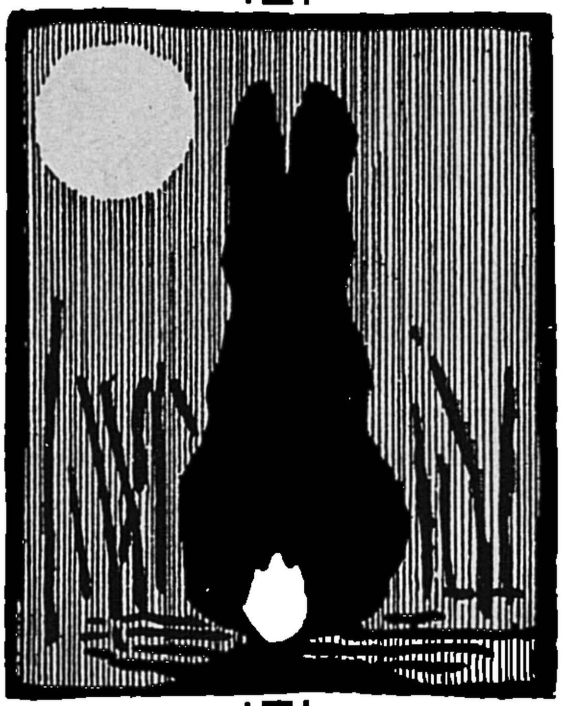

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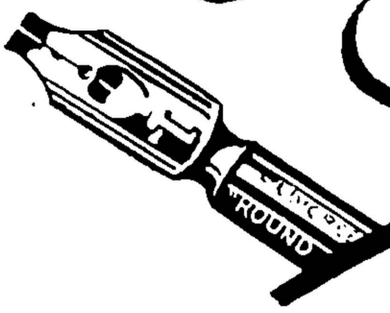

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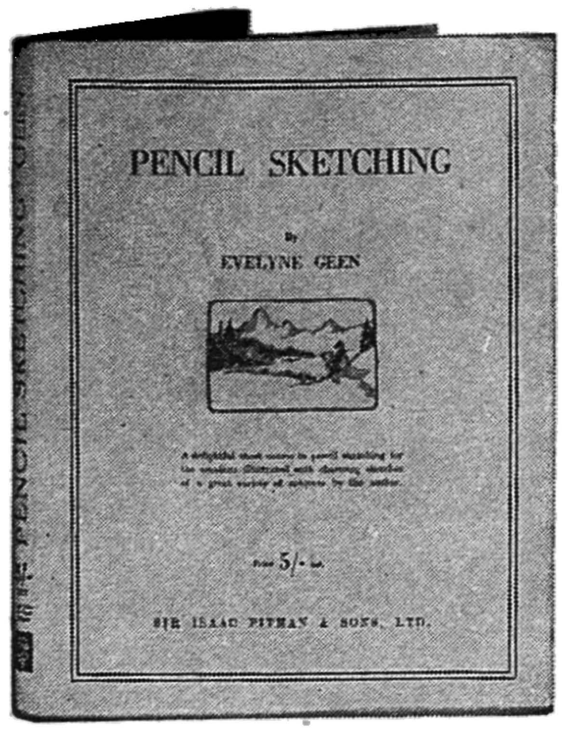

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